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PAGE 6

May/June

ATARI USERS MAGAZINE

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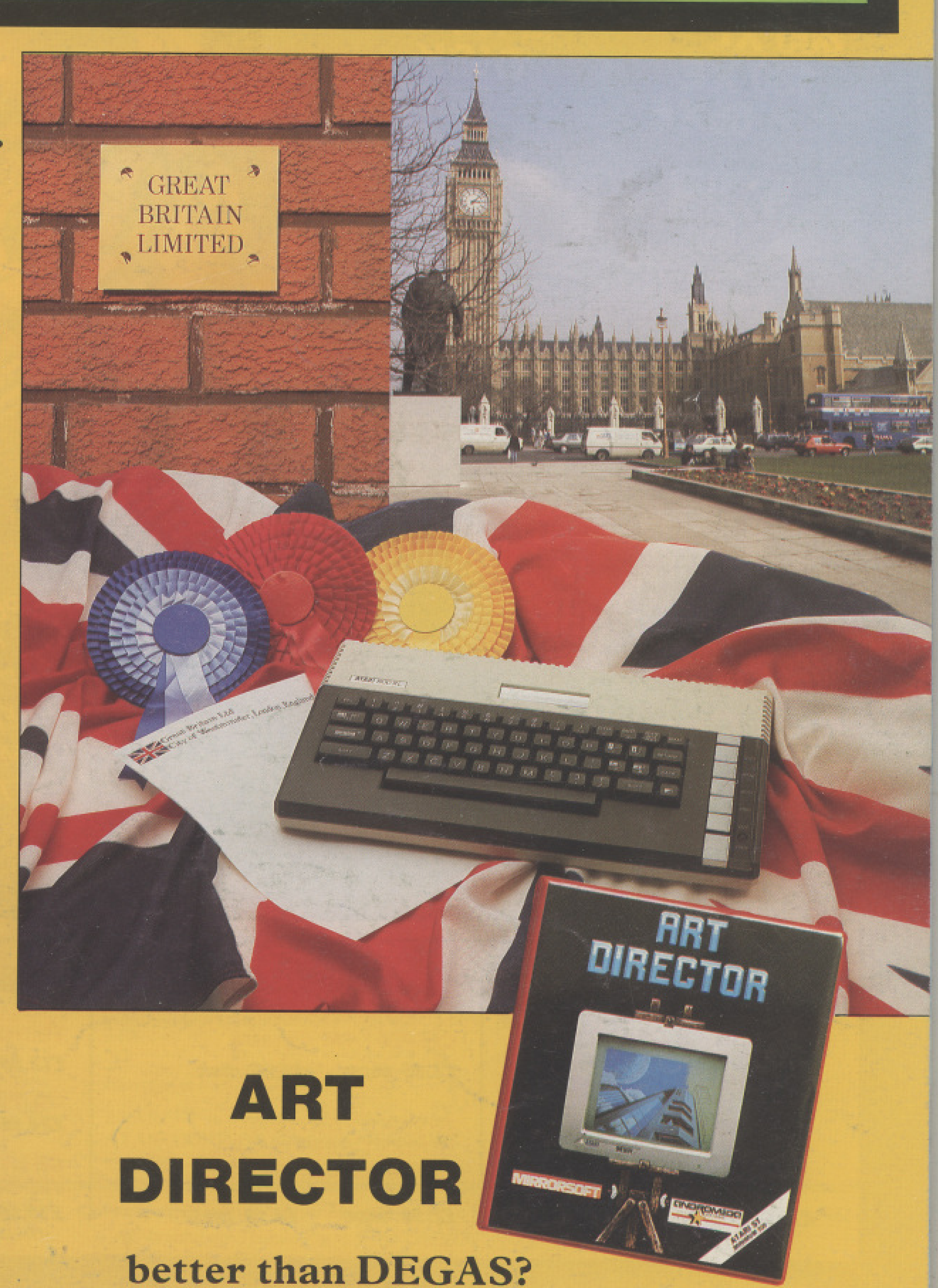
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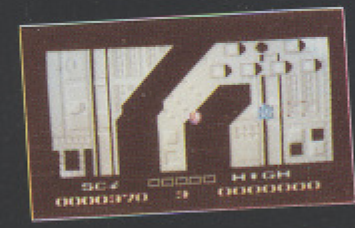
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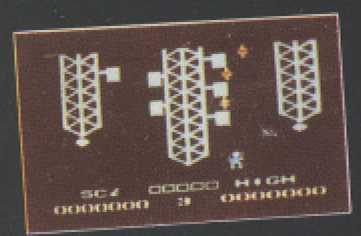
ASTRO-DROID

ATARI
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65XE

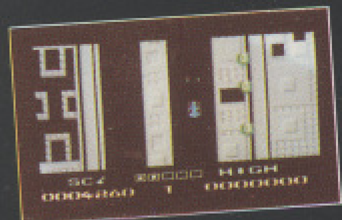
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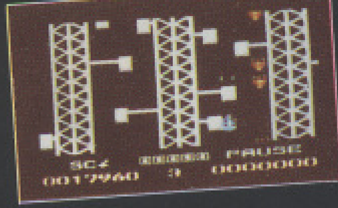












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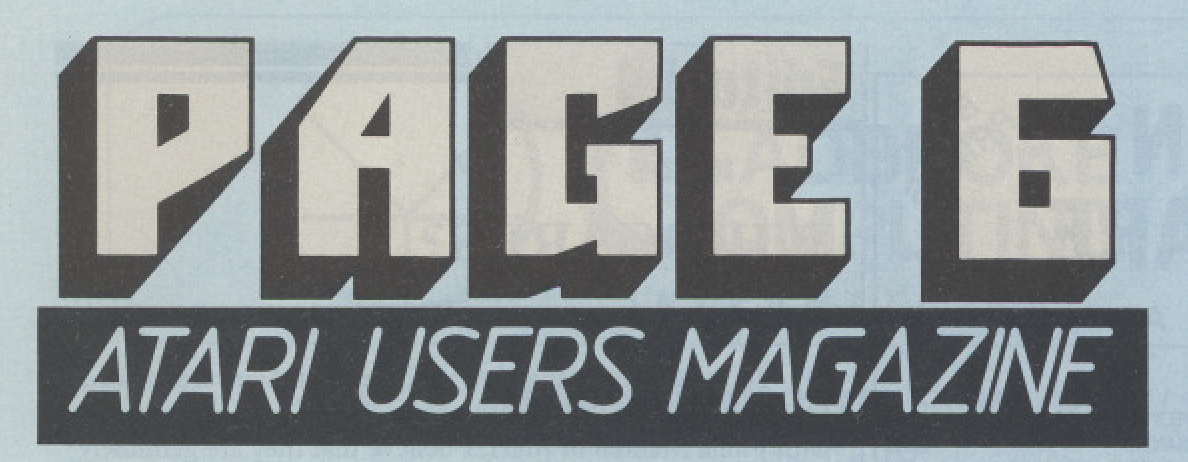
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Issue 27

May/June 1987

'The Magazine for the Dedicated Atari User'

LISTINGS

FEATURES

REVIEWS

STAGE

REGULAR DEPARTMENTS

NEXT ISSUE ...

MUNCHY MADNESS SCREEN GENERATOR
Design your own CROSSWORDS
FLYING on your ATARI
and a lot more that we haven't decided yet!
Copy date is 20th May. Publication date is 1st July.

PAGE 6 is published bi-monthly on the 1st of each alternate month.

PAGE 6 is a users' magazine which relies entirely on readers' support in submitting articles and programs. The aim is to explore ATARI computing through the exchange of information and knowledge. We will pay for articles and programs where appropriate and we hope that readers will enjoy seeing their work published. In turn we hope that other readers will learn from the articles and programs submitted and increase their enjoyment of Atari computing.

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Editorial

WHO CARES?

You will note in the News section that Atari are looking to encourage User Groups once more. From conversations with Fiona Mantell of Atari, I believe that they are genuinely interested in trying to do something to help but, like the users themselves, they are unsure as to exactly what can be done. In the past Atari users and User Groups have been quite vociferous in their complaints but often short on constructive ideas, so will it be any different this time? Do User Groups really care anymore? Judging from the abysmal response to our own efforts to give them publicity via the Resource File, it seems not. Take a look at the Resource File in this issue and you will see the number of groups who supplied details. There are many more groups that I know about and that I know are active but I am not going to include them unless they send in the details. Why not? Because if the secretary, or whoever, is too apathetic to spend a few minutes to tell the world about the group, how am I to know whether they want new members? Maybe they don't want anyone else to join them or maybe they are just so badly organised that I would feel embarrassed at encouraging a new owner to go along. Atari User Groups in the States get together to organise Fairs (with considerable support from Atari) at which up to 5,000 Atari owners may attend. What hope is there of groups in this country, who can't even manage to write down their meeting details, doing likewise? Prove me wrong, User Groups. Write to me, and to Atari. I just want your details, Atari wants your details and your constructive ideas.

I have been playing around with Fleet Street Publisher in getting this issue together and you should notice some worthwhile changes to the format. Whilst, at the time of writing, the program is limited in its output for professional use, any newsletter editor should take a look. It takes a long time to use to its fullest extent but will be well worth it. A brilliant program that will be reviewed shortly.

Talking about changes you will find other changes in the look of PAGE 6 following a change of printer. You may also have noticed that the cover price has been increased to £1.20. Sorry about that, but long term readers will have noticed that the number of pages has increased since we started covering the ST and several other factors combined to force an increase which should have been applied at least two issues ago. The cost of paper has risen alarmingly over the past year and postal rates have also increased. We will keep the U.K. subscription rate as it is for as long as we can but have had to make slight increases on the overseas rates. These reflect purely the postage costs for overseas mail. Please see page 3 for details.

I promised last issue to mention the recent survey but, to be honest, the comments were so many and so varied that we have run out of time in trying to analyse them. We currently have over 30 A4 pages of suggestions and comments to digest! All will be read and one or two have already been acted upon. Be assured that any comments you made will be read.

The summer months will be more hectic than ever with a 'major event' for us planned for Issue 29. We also have to recover from the April show and plan for PCW in September. I'll tell you more next issue.

A PAT ON THE BACK

Dear Les,

I read your editorial in issue 25 on the recent poll conducted by PAGE 6 and decided I had to make some comment about the reaction of some of the readers.

Obviously as an ATARI magazine you are obliged to cover the entire range of that product, be it 8 bit or ST. I feel that your magazine is the only publication that has a very good balance. The 8 bit owners (such as myself) are more than catered for with reviews, features and, above all else, great program listings.

I am of the opinion that listings are an integral part of the learning process and are very instructive as to how a program flows. Practice is better than theory! The utility listings you publish are top class, gaining rapidly on the Americans.

There is, however, one small criticism. I think that PAGE 6 should be a monthly publication because the games review section is a bit out of date by the time I purchase the magazine. Nonetheless, I will always look forward to getting my magazine every two months.

I am very interested in applications and utilities and would be grateful if any of my fellow readers would write to me to exchange ideas etc. If you could publish my name and address I would appreciate it.

Michael Casey, 3, St. Kevins Park, Kilmacud, Co. Dublin, Ireland

Thanks for the support which, fortunately, has been echoed by many other letters. So has that old request to go monthly, maybe one day! As regards reviews being 'out of date' I acknowledge that much of the software has been out for a while by the time our reviews appear but then not everybody rushes out to buy as soon as a program is released. Many of the other magazines hassle companies for pre-release versions of software so that they can be bang up to date but, whilst it is helpful to receive pre-release copies, I would rather we review exactly what you are are going to end up paying money for. We generally review most things we get in the next available issue so if you can be patient you might end up spending your money more wisely!

AUTOBOOTING MENUS

Dear PAGE 6,

May I thank you for a fine publication. Until I found you some time ago I had a miserable time typing in listings from other magazines that would not run. Typo 3 is a gem!

Not all my problems are solved however, for example I would like to make an autoboot for disk menu's. At the moment, whilst I have a menu program that will run other programs I cannot get it to boot without typing RUN "D: etc. I would appreciate any tips.

Also where can I get information on such things as the Memory Map, internal architecture etc.? Perhaps you could publish a list of reference material and where it may be obtained.

Jack Collins,
Co. Limerick, Ireland

Unfortunately you can't write your own autoboot program just like that (well you could, it depends on how good a machine language programmer you are!). We did publish an autorun program many years ago but it will not run on XL/XE machines. If any reader can come up with a nice original autoboot program, preferably one which allows you to insert BASIC statements to customise the AUTORUN.SYS created, we will publish it.
Details of the memory map can be had from Compute!'s Revised Mapping The Atari. Expensive at £16.95 but the one book no self respecting programmer should be without. You can get a copy from your local dealer or even from the PAGE 6 Accessory Shop. Write for details.

FIX YOUR OWN DISK DRIVE

Dear Les,

I have just fixed my 1050 drive and as the problem is similar to one that had previously afflicted my 810 I thought I would like to tell the world.

My 810 had officially been declared dead by an 'expert' so I dismantled it to find out how it worked. This included removing the sprung assembly, which presses a felt pad against the head. When I reassembled the sprung assembly, I though it seemed a bit weak so I gave it a little extra bend. Lo and behold the drive worked!

With the 1050 drive the symptoms were the same. On booting a disk, instead of getting beep, beep, beep etc. all I got was beep, (long pause), beep and then 'boot error'. I went straight to the pad assembly and found that the plate which lifts the

BAFFLED ....

Dear Sir,

Being new to computing, I think I am suffering from the same problems that a lot of users experience, that of being baffled by the technicalities. I can make the screen change colour, make sounds and print messages etc. but that is about my limit! Could you recommend a book that explains technical terms in English not in more technical terms?

One thing that has puzzled me is how the computer knows which group of DATA statements to read when it comes across a line such as RESTORE 14600 + LEV * 500 (from BERTIE). There must be something in the program to say which group is which.

Could you also tell me if there is an Atari User Group in the Brighton area?

T. Lyons,
Portslade, East Sussex

What I think beginners need before trying to understand the more advanced 'technicalities' is a good solid grounding in writing in BASIC. Probably the best book for this is ATARI BASIC – XL EDITION by Albrecht, Finkel and Brown and published by John Wiley. Work your way through it and you will have a good grounding on which to begin to understand the technicalities. From there on there are dozens of books to choose from, all good but each covering a different subject. Once you have the grounding you will be better able to determine which books are for you.

DATA statements are read by the computer from first to last unless RESTORE is used. Effectively, the computer has an internal pointer showing the current DATA statement is being read which is moved to the next statement as each one is read. It is important to read only the exact number of statements otherwise you will end up with Error 6 – Out of Data. RESTORE can be used to move the pointer to any line number, either forward or back, and can allow you to read the same data over and over. If you want to read DATA at line 1000, for example, you need to

pressure pad up and down did not have its full range of travel due to the upwards pointing prong on the slide assembly underneath. I tweaked this prong away and the pad could then reach the head. The disk drive was fixed.

The trouble is, I have no official knowledge of the working of disk drives so I am not sure whether what I have done is right! Any comments?

Paul Martin,
Ferryhill, Co. Durham

The first time my drive went wrong it cost me £20 (and that was at a cheap rate!) to have it repaired. All the repairer did was adjust the pressure pad. Next time I did it myself. The main problem seems to be that the pressure pad which pushes the disk down on to the head below gets compacted with use and ends up exerting less pressure on the disk and therefore on the head. Whenever a drive fails to read or write, I just take off the casing and carefully rough up the felt pressure pad, removing any oxide that has built up. It has worked every time.

You don't even have to dismantle anything (apart from the case) but make sure that you don't damage the head below. Try inserting a disk the wrong way round to cover the head before getting to the pad. Whether you do this yourself is entirely up to you (I don't accept any responsibility for clumsy hands!) but it may be better than paying somebody else up to £50 to do the same thing!

*put RESTORE 1000 in your program just before you read the DATA. It is also possible to use variables in RESTORE statements as in the example you have given. The variables are set by another part of the program. In the above example, DATA for the screen is given at different points depending on the level. When the level (LEV) is 1 the DATA will be read from line 15100 (14600+(1*500)). On level 2 (LEV=2) the DATA is read from 15600 and so on. Hope that helps a little, but the book above will explain more.*

We are still waiting for the User Group in Brighton to send the details for our Resource File!

THE TRANSLATOR

Dear Les,

I have several games written for the 400/800 Atari's but can't run them on my 800XL. Is there a program or utility to make a transfer to XL possible?

I have tried a program from one of Atari's suppliers but the instructions were so poor that I eventually gave up. Can you help?

Michael Kloss,
Tamworth, Staffs

If you use disk, you can buy a disk from the PAGE 6 library of public domain software for £3.95. Ask for Disk £36. This includes a good translator program that seems to work on the majority of programs. Full instructions are included. There are, however, one or two programs that will not run on the XL, no matter what so you might still be unlucky. I hope not.

STARTING A USER GROUP

Dear Les,

I am an Atari User of about five years and I've seen the dramatic turn round in the fortunes of our common interest. I've gone from a 400 which cost me over £300 to a 130XE which I picked up (with a 1010 thrown in) for £49.99!

I am thinking of doing something locally to propagate Atari and I really need some advice on the pitfalls involved in starting something like this. Any advice would be gratefully accepted. Is there an association of User Groups for instance?

Peter Lock,
Royal Leamington Spa,
Warks

User Groups in general tend to be fairly informal and rarely conform to any set standard. It needs a strong minded individual to start it up, build it up and keep it going and it often ends up being a 'shepherd and sheep' situation. You need to be strong to survive. You might like to ask someone like Ken Ward of NUGGETT in Norwich who is one such individual who has fought long and hard for Atari both locally and nationally. He has tried to set up a national association of Atari users groups and might put you in touch with others. He might also be able to warn you when to expect the nervous breakdown! Ken's address is 45, Coleburn Road, Lakenham, Norwich, NR1 2NZ.

Atari themselves have finally re-awoken to the benefits of User Groups and may be able to give some help, but they really need help themselves from some of the existing User Groups (see News item).

SMARTSHEET PROBLEMS ...

Dear Sirs,

Have you had any complaints about Smartsheet? I found that it will not handle some calculations if the results are a string of digits. This seems to be a string length error?

D. Hunt,
Oakham, Leics.

... ANSWERED

Dear Les,

Thank you for your reply on Smartsheet. Further study shows that the error occurs when dividing two cells which gave an answer longer than 8 digits e.g. 10 / 3 = 3.333333333 etc. In the program this would become A and LEN(A$) would then be 10.

The problem occurs in line 1270 which tries to deduct the length of A$ from 8 resulting in a minus number which subsequently causes an error in OUT$. I amended line 1270 as follows

```
1270 L=8-LEN(A$):IF L>0
 THEN L=0:OUT$(CP,CP+L)=
 CL$:OUT$(CP+L,CP+7)=A$:
 RETURN
```

The program now runs but it cannot handle small numbers in E format.

W.J. Charles,
Swansea

REVISION C ON CASSETTE

Dear Sir,

You published a program in a recent issue by Brad Finney installing Revision C Basic on disk. Would it be possible to amend this program for the benefit of cassette users such as myself?

Some of the programs in PAGE 6 will not run on my 800XL, the most recent being FORKLIFT. Every line checks with Typo but I keep getting Error 9. I take it that this is caused by the faulty BASIC. Is there any way round this error or do I have to get Revision C?

Jas Wallace,
Stonehouse, Lanarkshire

Is there enough call for a cassette based version of Revision C? FORKLIFT will definitely run on an 800XL so it looks like the problem is indeed a faulty BASIC. You could try LISTing the program to a new cassette, switching off and then ENTERing the program again. It might well run. If it doesn't, and you are convinced you have no missing lines or errors, then Revision C is the only answer.

ATARI NEEDS USER GROUPS!

Atari have at last come round full circle and are seeking to actively encourage and support User Groups. In the States many of the larger User Groups get together to promote 'Atari Fairs' in different parts of the country and receive a great deal of support from Atari by way of equipment loan, promotion and guidance. Could the same thing happen over here? That is what Fiona Mantell of Atari would like to know.

What Fiona needs first is for all established User Groups to get in touch with her giving full details of the group and putting forward some ideas of how you feel that Atari might be able to help the your group in the future. Make no mistake, Atari are interested in helping but it is not a one way street, a great deal of commitment and effort will be needed by the Groups themselves to make anything work. If you feel that your User Group is good enough to deserve some recognition and support from Atari write to Fiona Mantell at Atari Corp. (UK) Ltd, Atari House, Railway Terrace, Slough, Berks, SL2 5BZ. Do it now.

SSI ON TARGET

U.S. Gold's release schedule of SSI's range of wargames and simulations is well on target with 10 titles due to be available at the time of writing and another 19 to follow! So far the releases have all been on disk and are around the £29.99 mark.

Cheapest so far, and perhaps one of the most interesting, is Wargame Construction Set for those who have played everything or think they are better at designing games than SSI! Other titles released include Battle of Antietam, Gettysburg, U.S.A.A.F, Broadsides, Mech. Brigade, Carrier Force, Panzer Grenadier, Colonial Conquest and Computer Ambush. Wargamers and simulation fans have surely never had it so good!

News

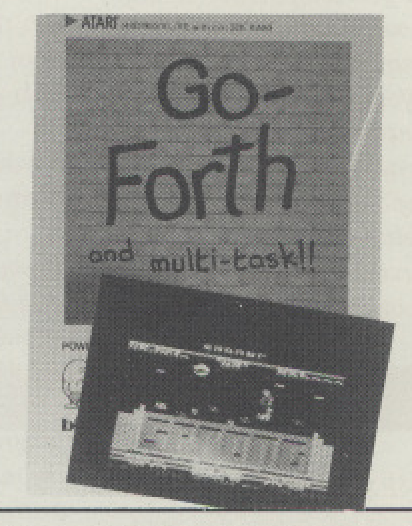
STAR WARS

Domark, who got the computer rights to one of the most sought after games of recent times, Trivial Pursuit, have now signed an agreement with Atari Inc. (the coin-op company) for the home computer rights to the arcade smash Star Wars. You will have a long time to save up though as programming will not start until later this year with release due in 'late 1987'. An Atari 8 bit version is promised but let's hope that it is not last in the queue otherwise who knows when 'late 1987' might be!

YET MORE SMASH HITS

English Software recently released Smash Hits Volume 7, or was it 6? It could have been 8, no it is definitely 7 and it features Elektraglide, Colossus Chess 3.0, Blue Max and Alley Cat. Two cassettes at £9.95 or two disks at £14.95. The press release says 'advertising in ATARI USER' so if you don't read ATARI USER you might never know it's available. If that's the case you could write to English Software and tell them you read about it in PAGE 6 and you could also ask when they are going to release some more original games for the Atari. Remember when English Software were the top Atari software house in the U.K.?

RED RAT TO THE RESCUE



Red Rat, fast becoming THE company for the Atari 8-bit machines have come to the rescue of a couple of programs that nearly disappeared along with the ill-fated S.E.C.S. An agreement has been reached with Bignose Software for Red Rat to release GO-FORTH (reviewed in Issue 25) and SPRONG. GO-FORTH will be available on disk only for the XL/XE at £19.95 and SPRONG, by none other than Paul Lay, has already been released on tape at £7.95 or disk at £9.95. Anyone who thought that MUNCHY MADNESS from PAGE 6 was good (and it was excellent) should rush out to get a copy of SPRONG. There are something like fifty superbly drawn and challenging screens for you to pogo your way through and you will be impressed.

Other releases from Red Rat include Astro Droid, an arcade shoot-em-up by the author of Screaming Wings, and a new budget game for two players, River Rally. Fast action with split scrolling screens is promised.

Say thank you to the Red Rat, Atari owners. While others promise he is nosing around finding all sorts of goodies for you.

THE REST OF THE NEWS ....

Mastertronic dropped us a press release to say that their next Atari release would be COLONY.

Apart from that, and the other stories on this page, all the other press releases we received contained words like 'except for Atari'. We threw them in the bin. There must be more news about software for the Atari, like the (rumoured?) stuff from Imagine, but why don't the companies concerned shout about it? Half an hour on the typewriter and a second class stamp might get Atari owners into the shops asking for the latest releases.



READERS POLL 1986
THE RESULTS

Yet again your votes showed the consistency of previous years with almost every eligible article or program receiving votes. Again the same type of articles appeared near the top of the poll indicating, hopefully, that we are continuing on the right track.

As you may know, if you are a long term reader, the basis was changed a little this year so that awards were given for the Best Article, Best Program and Best Miscellaneous. Remarkably the three programs that received the most votes overall came from each of the categories. So here, for those who can't wait any longer, is the result of the Readers Poll for 1986.

Best Article(s):	**FIRST STEPS** by Mark Hutchinson
Best Program:	**MUNCHY MADNESS** by Paul Lay
Best Miscellaneous:	**SHORT REVIEWS** by Jim Short

Congratulations to each of the above and thank you to everybody who voted. Your interest is much appreciated. The winners will each receive a handsome trophy which we'll show you next issue (we are still waiting for it!!).

For interest, the remainder of the' Top Ten' – those who nearly made the awards – is as follows.

Smartsheet by Ken Shiu
Adventure Column by Garry Francis
A Guide to Error Codes by Steve Pedler
Ultima IV by John Sweeney
Speed Check by Garry Francis
Going Online by John Davison
Display Lists by Steve Pedler

Thank you again to all those who contributed and those who voted. Keep the contributions coming and, maybe, next year you could be the proud owner of an exclusive PAGE 6 trophy!

APOLOGIES!

The Speedscript review on page 70 of Issue 26 was wrongly credited to Eddie Cross. It was written by Eddie Cousins. Sorry Eddie!

GREAT BRITAIN Ltd

by Alan Page

Enthusiasts who started their hobby with the Sinclair ZX81 *(shame on you! Ed.)* may remember the original version of Great Britain Limited from Hessell Software. The player assumes the role of Chancellor of the Exchequer and each year for five years must carefully set the level of various taxes and social benefits. At the end of five years a General Election is held where only skilful Chancellors are re-elected to another five years in office. Get re-elected often enough and you are in the running for a Knighthood!

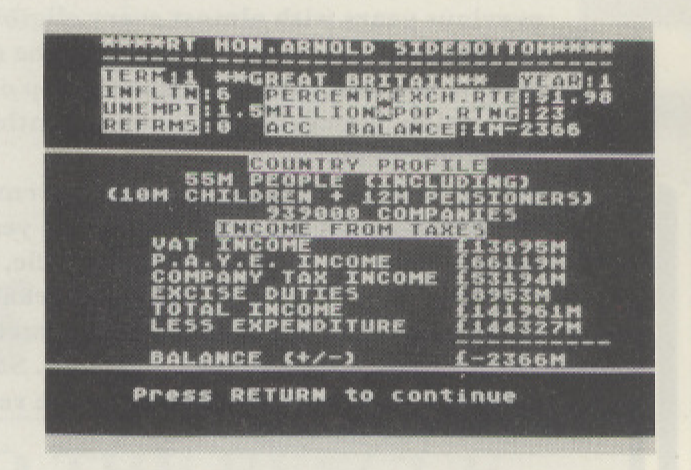
A permanent display keeps you in touch with the economic state of the Nation, quoting such things as unemployment, inflation, VAT, the balance of payments and, perhaps most important of all(!), your popularity rating. In the second and subsequent terms of office the going gets tougher and it takes considerable skill to get your party re-elected as any Prime Minister will tell you.

The Atari version is closely modelled on the ZX81 game with substantial additions to introduce colour and music. Two black panels containing information and instructions are found at the top and bottom of the screen, divided by a central panel of a colour appropriate for your chosen Party. Who said you can only have one background colour in Graphics 0?

A SPECIAL DISPLAY SCREEN

The program itself is quite straightforward but some of you may be interested in details of the display list so that you can use similar techniques in your own programs. I have included three tables which give most of the details necessary. Table 1 contains the complete display list. The first three numbers, and the number 16 which follows the two interrupts, represent blank scan lines which produce the border around the display and are set to divide the coloured panels of the display. Table 2 contains a full list of numbers to include in display lists to obtain different widths of blank border colour. Remember that in Mode 0, a normal line of text is 8 scan lines in depth. If you wish to set screen colours without having to type in the whole program, just type in lines 760 – 880.

The Assembly Language program of the two display list interrupts is shown in Table 3, together with an explanation of the purpose of each machine code instruction. The machine code is stored in page 6, at location 1536 onwards. The third number of the DLI corresponds to the colour which is subsequently loaded into the background colour register located at D018 Hex. The colour number is shown as a 0 in Table 3 but before the DLI is used the colour DATA is POKEd into the third byte of the DLI by program lines 910 – 930. The formula for the colour data is : COLOUR NUMBER * 16 + LUMINANCE. For the Conservative Party, for example, instead of using SETCOLOR 2,7,4 to obtain blue, the machine code equivalent is 116 (7 * 16 + 4). The colour data is loaded into the hardware register for immediate effect and not into the shadow register which is



only copied into the hardware register during the Vertical Blank Interrupt occurring at the end of drawing the whole screen.

Since there are two DLI's during the drawing of the screen, each loading the hardware register with a different colour, it is necessary at the end of each interrupt to reset the start address of the interrupt to be used next. The low byte of this address is stored in location 512 ($200).

The most annoying thing about a program with multiple interrupts is the presence of the cursor and the question mark on the screen. The cursor is made invisible by POKE 752,1 and the question mark can be avoided by opening a channel to the screen editor for input and output at line 420. All inputs are then of the form INPUT #1, *variable name*. The screen editor echoes the input to the screen so that you can see what is typed in, and correct it if necessary, but does not display a question mark.

IN CONCLUSION

The music is provided to offer light relief in between your struggles with mounting inflation and unemployment. When you have heard enough just press START.

The original algorithms for calculating the effects of taxes and expenditures are unchanged from the ZX81 version. Now is the time for all you budding economists out there to fathom out how the algorithms work and to design some additional modules. How about the selling of National assets or Nationalisation or the effects of curbing local government spending?

ACKNOWLEDGEMENTS

My thanks to Simon Hessel for kind permission to publish Great Britain Limited.

My thanks to Michael Doolan for help and advice with the music.

```
EI 1 REM ********************************
DX 2 REM *      GREAT BRITAIN LTD.      *
HT 3 REM *(c) Simon W. Hessell Software*
TB 4 REM *                              *
EG 5 REM *    ADAPTED BY ALAN PAGE      *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ********************************
NO 9 REM
KJ 90 REM ***        TITLE SCREEN        ***
DS 100 GRAPHICS 2:SETCOLOR 0,3,4:SETCOLOR
   1,0,8:SETCOLOR 3,7,4
UZ 110 POSITION 1,4:? #6;"GreAt bRitAin L
   td"
KR 120 SETCOLOR 2,0,0:? "ADAPTED FOR THE
   ATARI BY ALAN PAGE"
XO 130 GOSUB 14006
MC 140 REM ********************************
QE 150 REM ***     INITIALISATION     ***
YT 160 DIM O$(40),D$(40),A$(24),B$(1),K$(
   1),L1$(12),L2$(12),L3$(12),M1$(12),M2$
   (12),M3$(12)
RZ 170 K=1:T=1:G=0:I=0.1:U=2:E=2:P=0:IX=0
   .3:CX=0.5:PX=0.8:KT=1:TX=0.6:F=100:AX=
   4:OAC=2:VX=0.15:B=0:OT=132000
LX 180 S=0:OO=2:L=0:PO=0:C=55:FA=10:OP=12
   :CO=1000:TP=25:CC=0.5:DD=3:EE=0.7:FF=5
   .5:GG=30:HH=28:VV=83000
PI 190 XA=128000:XC=65:XZ=200:RR=100:D=0.
   2:II=0:JJ=0:KK=0:LL=0:MM=0
AG 200 AA=INT(((RND(0)*5)+1)+98)
NL 210 IN=7450+(INT(((RND(0)*10)+1)*100))
LZ 220 REM ********************************
```

Table 1 – Display List – Mode 0 Screen

Each display list entry is numbered for the sake of clarity. These line numbers are not entered into the program.

Line	Display List Instruction	Purpose
1	112	Eight blank scan lines
2	112	Eight blank scan lines
3	48	Four blank scan lines
4	66 (64+2)	Load Memory Scan plus one mode 0 line.
5	64	Low byte of start of screen memory.
6	156	High byte of start of screen memory.
7	2	Mode 0 line
8 – 11	2 (each line)	Total 4 mode 0 lines
12	130 (128+2)	Display List Interrupt plus mode 0 line
13	16	Two blank scan lines
14	2	Mode 0 line
15 – 25	2 (each line)	Total 11 mode 0 lines
26	130 (128+2)	Display List Interrupt plus mode 0 line
27	16	Two blank scan lines
28	2	Mode 0 line
29 – 31	2 (each line)	Total 3 mode 0 lines
32	65	Jump Vertical Blank (to following address)
33	50	Low byte of start address of display list
34	6	High byte of start of display list

Table 2 – Blank Lines

Display List Instruction	Number of blank scan lines
0	1
16	2
32	3
48	4
64	5
80	6
96	7
112	8

```
XB 400 REM ***SELECT NAME AND PARTY***
AC 410 GRAPHICS 0:POKE 756,204:POKE 752,1
   :POKE 16,64:POKE 53774,64:TRAP 11000
AS 420 OPEN #1,12,0,"E:":SETCOLOR 2,0,0:S
   ETCOLOR 4,0,8
QK 430 POSITION 5,2:? "ENTER YOUR NAME (M
   AX 24 CHRS)"
SU 440 INPUT #1,A$
RL 450 ? "K"
YH 455 IF LEN(A$)<25 THEN 500
HV 460 IF A$="" THEN 430
PC 480 IF LEN(A$)>24 THEN POSITION 5,10:?
    "TOO MANY CHARACTERS - RE-ENTER"
OM 490 GOTO 430
ZN 500 POSITION 4,0:? "WHICH PARTY DO YOU
    REPRESENT: "
LE 510 L1$="CONSERVATIVE"
EA 520 L2$="   LABOUR   "
DX 530 L3$="LIBERAL/SDP."
KY 540 POSITION 11,7:? "A.";L1$
CK 560 POSITION 11,9:? "B.LABOUR"
OI 570 POSITION 11,11:? "C.";L3$
GR 580 POSITION 4,21:? "ENTER A-C THEN PR
   ESS RETURN"
YP 590 INPUT #1,K$
KF 600 IF K$="A" OR K$="B" OR K$="C" THEN
    630
SH 610 GOSUB 10000
QN 620 GOTO 580
BB 630 IF K$="A" THEN M1$=L1$:GOTO 670
UR 640 IF K$="B" THEN M1$=L2$:GOTO 700
YU 650 IF K$="C" THEN M1$=L3$:GOTO 720
DH 660 PRINT "CHR$(125)"
CJ 670 M2$=L2$
DB 680 M3$=L3$
QO 690 GOTO 750
BM 700 M2$=L1$
QW 710 GOTO 680
BQ 720 M2$=L1$
CI 730 M3$=L2$
```

Table 3 – DISPLAY LIST INTERRUPTS

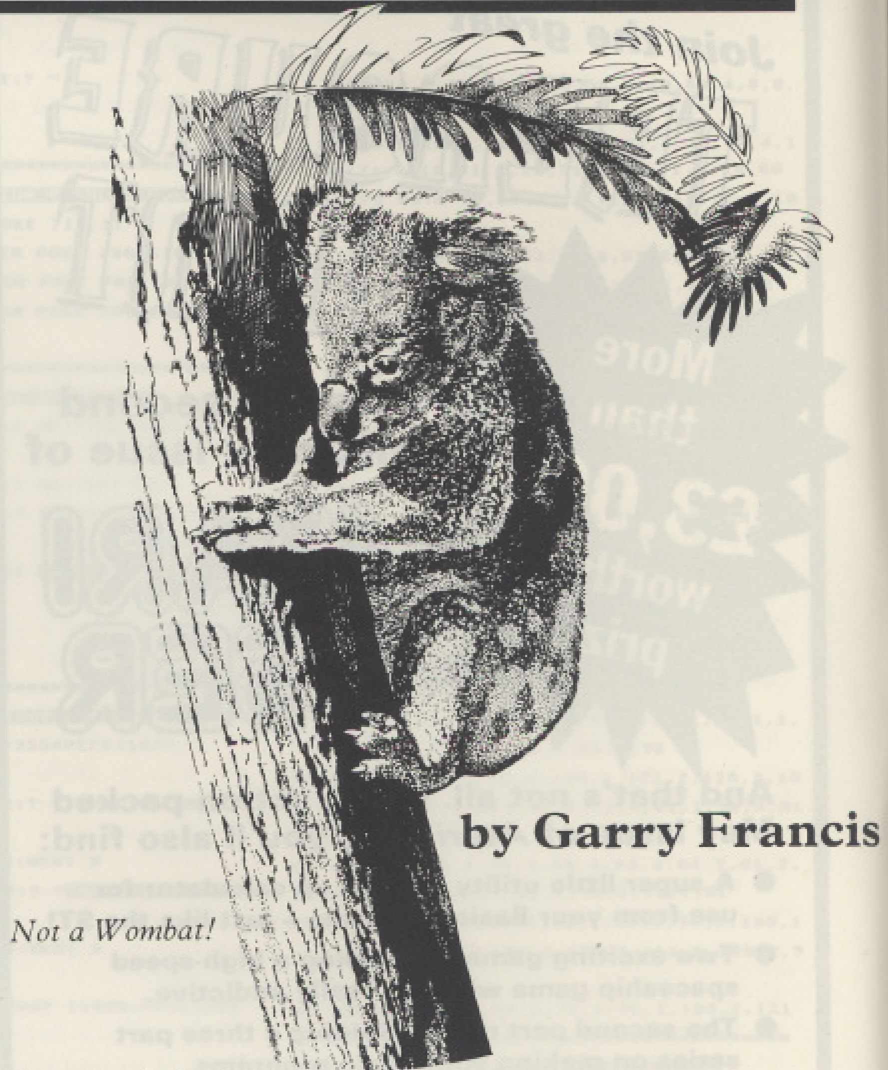
Assembled code (Hexadecimal)	Assembly Language	Purpose
First Interrupt		
48	PHA	Stores accumulator on stack.
A9 00	LDA# $0	Load accumulator with colour data.
8D 0A D4	STA WSYNC	Synchronises interrupt with start of a new scan line.
8D 18 D0	STA COLOR	Stores colour data into hardware register for background colour.
A9 10	LDA# $10	Load accumulator with 16 decimal.
8D 00 02	STA $200	Store accumulator in $200 (location 512) to direct the next DLI to the 2nd interrupt.
68	PLA	Restore the original contents of the accumulator from the stack.
40	RTI	Return from Interrupt.
Second Interrupt		
48	PHA	
A9 00	LDA # $0	Load colour number – 0 for black.
8D 0A D4	STA WSYNC	
8D 18 D0	STA COLOR	
8D 18 02	STA $200	Stores 0 in location 512 to point to first interrupt
68	PLA	
40	RTI	

```
MI 740 REM ****************************
AR 750 REM ***DISPLAY LIST INTERRUPT***
ZJ 760 RESTORE 790
NB 770 FOR X=0 TO 29:READ Z
CP 780 POKE 1536+X,Z:NEXT X
IR 790 DATA 72,169,0,141,10,212,141,24,20
   8,169,16,141,0,2,104,64,72,169,0,141,1
   0,212,141,24,208,141,0,2,104,64
MB 800 REM ****************************
KE 810 REM ***     DISPLAY LIST      ***
JK 820 FOR X=0 TO 33:READ Z
EO 830 POKE 1586+X,Z:NEXT X
YX 840 POKE 88,64:POKE 89,156:REM **Addre
   ss of screen memory**
ON 850 POKE 560,50:POKE 561,6:REM **Addre
   ss of display list**
OY 860 DATA 112,112,48,66,64,156,2,2,2,2,
   2,130,16,2,2,2,2,2,2,2,2,2,2,2,130,1
   6,2,2,2,2,65,50,6
HN 870 POKE 512,0:POKE 513,6:REM **Addres
   s of DLI**
CD 880 POKE 54286,192:REM **Enable DLI**
MT 890 REM ****************************
HF 900 REM *** DRAW ANNUAL HEADINGS ***
NK 910 IF K$="A" THEN POKE 1538,116
CK 920 IF K$="B" THEN POKE 1538,50
ZZ 930 IF K$="C" THEN POKE 1538,20
EN 940 OO=2:POKE 16,64:POKE 53774,64
JD 950 Y=1
RS 960 ? "K"
PZ 970 POSITION 4,0:? "*******************
   ************"
VL 980 POSITION 4,1:? "-------------------
   --------------"
JW 990 A=INT(40-(7+LEN(A$)))
HP 1000 A=A/2
NT 1010 FOR X=1 TO LEN(A$)
HM 1020 POSITION A,0:? "RT HON."
QH 1030 POSITION A+6+X,0:? A$(X)
LK 1040 NEXT X
MO 1050 IF OO=1 THEN RETURN
OA 1060 POKE 756,204:POKE 752,1
YA 1070 POSITION 11,2:? "**GREAT BRITAIN*
   *"
LZ 1080 POSITION 4,2:? "TERM:"
CE 1090 POSITION 30,2:? "YEAR:"
PK 1100 POSITION 4,3:? "INFLTN:"
CP 1110 POSITION 4,4:? "UNEMPT:"
TS 1120 POSITION 14,3:? "PERCENT*EXCH.RTE
   :$"
WU 1130 POSITION 14,4:? "MILLION*POP.RTNG
   :"
UU 1140 POSITION 4,5:? "REFRMS:"
CC 1150 POSITION 14,5:? "ACC  BALANCE:◢M"
QQ 1160 REM ****************************
CH 1200 REM ***  MAIN CONTROL BLOCK  ***
UO 1210 IF T>1 THEN GOSUB 9505
TJ 1220 IF T>1 THEN GOTO 1250
DB 1230 GOSUB 9500
GO 1240 IF XC/XD>1.4 THEN GOSUB 9800
CM 1250 GOSUB 1505
AF 1260 GOSUB 1600
TW 1270 IF Y=5 THEN GOTO 5000
AR 1280 GOSUB 8000
YA 1290 GOSUB 2000
SZ 1300 Y=Y+1
IA 1310 IF IX>0.5 THEN GOSUB 9600
PL 1320 GOTO 1230
QL 1330 REM ****************************
BV 1500 REM ***  COUNTRY PROFILE     ***
UT 1505 POSITION 13,7:? "COUNTRY PROFILE"
LZ 1510 POSITION 9,8:? C;"M PEOPLE (INCLU
   DING)"
LD 1520 POSITION 4,9:? "(";FA;"M CHILDREN
    + ";OP;"M PENSIONERS)"
HV 1530 POSITION 14,10:? CO*1000;" COMPAN
   IES"
OO 1540 POSITION 11,11:? "INCOME FROM TAX
   ES"
DD 1545 POSITION 7,12:? "VAT INCOME
      ◢";VT;"M"
VX 1550 POSITION 7,13:? "P.A.Y.E. INCOME
      ◢";IA;"M"
XZ 1555 POSITION 7,14:? "COMPANY TAX INCO
   ME ◢";CI;"M"
UI 1560 POSITION 7,15:? "EXCISE DUTIES
      ◢";TS;"M"
HV 1565 POSITION 7,16:? "TOTAL INCOME
      ◢";TT;"M"
QO 1570 POSITION 7,17:? "LESS EXPENDITURE
      ◢";XP+XZ;"M"
KN 1571 POSITION 26,18:? "-----------"
AF 1572 POSITION 7,19:? "BALANCE (+/-)
      ◢";TT-XP-XZ;"M"
EL 1573 OT=TT+XB+XZ
DA 1575 GOSUB 9200
GI 1580 GOSUB 9225
BK 1590 RETURN
SB 1595 REM ****************************
SL 1599 REM ***    SHOPPING BASKET   ***
FP 1600 POSITION 12,8:? "SHOPPING BASKET"
AV 1610 POSITION 8,10:? "PETROL"
IW 1620 POSITION 8,11:? "SCOTCH"
CZ 1630 POSITION 8,12:? "CIGARETTES"
FC 1640 POSITION 8,13:? "MILK"
HR 1650 POSITION 8,14:? "BREAD"
AI 1660 POSITION 8,15:? "TEA"
IE 1665 GOSUB 9750
SF 1670 POSITION 6,17:? "AVERAGE INCOME"
SO 1680 POSITION 6,18:? "RETAIL PRICE IND
   EX"
NA 1690 POSITION 24,10:? ":◢";(INT((EE+PX
   +(EE*I))*100))/100
LP 1700 POSITION 24,11:? ":◢";(INT((DD+AX
   +(DD*I))*100))/100
HQ 1710 POSITION 24,12:? ":◢";(INT((CC+TX
   +(CC*I))*100))/100
ME 1715 D=(INT((D+(D*I))*100))/100
JB 1720 POSITION 24,13:? ":◢";D
KL 1730 POSITION 24,14:? ":◢";D*2
WW 1740 POSITION 24,15:? ":◢";D+(D/2)
XU 1750 POSITION 24,17:? ":◢";INT(IN)
XF 1755 RR=INT(RR+(RR*I))
MU 1760 POSITION 24,18:? ": ";RR
CK 1770 GOSUB 9200
HD 1775 GOSUB 9225
BL 1780 RETURN
RL 1790 REM ****************************
ID 1999 REM ***    SOCIAL REFORMS    ***
VX 2000 POSITION 10,8:? "REFORM OPPORTUNI
   TY:"
OE 2010 POSITION 13,10:? "REFORM.........
   .◢M"
TD 2020 POSITION 4,12:? "A.IMPROVE HEALTH
    SERVICE :";II;"  "
GC 2030 POSITION 4,13:? "B.BUILD NEW HOME
   S        :";JJ;"  "
VV 2040 POSITION 4,14:? "C.JOBS FOR SCHOO
   L LEAVERS:";KK;"  "
JF 2050 POSITION 4,15:? "D.BUILD NEW SCHO
   OLS      :";LL;"  "
GJ 2060 POSITION 4,16:? "E.IMPROVE ROAD S
   YSTEM    :";MM;"  "
GS 2080 POSITION 4,18:? "F.WHEN FINISHED"
AU 2100 POSITION 4,21:? "ENTER PREFIX OF
   REFORM TO CHANGE"
FP 2110 INPUT #1,B$:GOSUB 10000
EV 2120 IF B$="F" THEN GOTO 2235
OC 2130 IF B$>"F" OR B$="" OR B$<"A" THEN
    GOTO 2100
OR 2150 POSITION 4,21:? "HOW MUCH DO YOU
   WISH TO ALLOCATE"
HM 2160 IF B$="A" THEN INPUT #1,II:POSITI
   ON 30,12:? "          ":POSITION 30,12:
   ? II
VF 2170 IF B$="B" THEN INPUT #1,JJ:POSITI
   ON 30,13:? "          ":POSITION 30,13:
   ? JJ
IY 2180 IF B$="C" THEN INPUT #1,KK:POSITI
   ON 30,14:? "          ":POSITION 30,14:
   ? KK
WR 2190 IF B$="D" THEN INPUT #1,LL:POSITI
   ON 30,15:? "          ":POSITION 30,15:
   ? LL
JI 2200 IF B$="E" THEN INPUT #1,MM:POSITI
   ON 30,16:? "          ":POSITION 30,16:
   ? MM
AG 2201 GOSUB 10000
NZ 2230 GOTO 2100
WH 2235 POSITION 29,17:? "-------"
RO 2237 XZ=II+JJ+KK+LL+MM
XS 2240 POSITION 30,18:? "      ":POSI
   TION 30,18:? XZ
CM 2245 GOSUB 9200
GB 2250 J=INT(RND(0)*5)+1
LJ 2260 K=INT(RND(0)*2+T)+1
KH 2265 F=F+(F*I)
FU 2267 IF S=3 THEN GOTO 2296
CS 2270 IF J=1 AND II>(K*F) THEN GOSUB 25
   10
EU 2272 IF J=2 AND JJ>(K*F) THEN GOSUB 25
   10
GW 2274 IF J=3 AND KK>(K*F) THEN GOSUB 25
   10
IY 2276 IF J=4 AND LL>(K*F) THEN GOSUB 25
   10
LA 2278 IF J=5 AND MM>(K*F) THEN GOSUB 25
   10
XE 2290 IF XZ>(200*K) AND PO<20 THEN PO=P
   O+10
HE 2296 GOSUB 9225
AG 2300 RETURN
EG 2510 O$="A SOCIAL REFORM IS RECOGNIZED
   "
GP 2520 D$="A SOCIAL REFORM IS RECOGNIZED
   ■"
SR 2530 FOR X=8 TO 19
LL 2535 POSITION 4,X:? D$
VV 2537 FOR DEL=1 TO 10:NEXT DEL
LV 2540 NEXT X
KW 2545 FOR X=19 TO 8 STEP -1
UZ 2550 FOR DEL=1 TO 10:NEXT DEL
UO 2555 POSITION 4,X:? O$
MB 2560 NEXT X
TE 2570 IF S<3 THEN S=S+1
AO 2800 RETURN
QQ 2810 REM ****************************
EQ 4999 REM ***   ELECTION RESULTS   ***
WB 5000 OO=1
CD 5010 GOSUB 970
IE 5020 POSITION 12,2:? " ";M1$;"  "
PN 5030 POSITION 4,3:? "__________________
   ________________"
US 5040 POSITION 12,4:? "*ELECTION NIGHT*
   "
RB 5050 POSITION 4,5:? "__________________
   ________________"
CS 5080 GOSUB 7500
WH 5090 POSITION 13,7:? "PARTY"
FU 5100 POSITION 10,9:? M1$
XY 5110 POSITION 10,12:? M2$
BE 5120 POSITION 10,15:? M3$
HP 5135 GOSUB 9750
IP 5140 POSITION 27,7:? "SEATS"
ML 5150 G1=0
MV 5160 G2=0
NP 5180 G4=0
DZ 5500 W1=300*(P/100)
QX 5502 W2=300-W1
ZZ 5505 GOSUB 6000
ZF 5510 IF I<0.12 THEN W1=INT(50*((0.11-I
   )/0.1))
TD 5520 IF I>0.11 THEN W1=0
QO 5522 W2=50-W1
AF 5525 GOSUB 6000
HZ 5530 IF U<2.1 THEN W1=INT(100*((2-U)/2
   ))
LQ 5540 IF U>2 THEN W1=0
OR 5542 W2=100-W1
AL 5545 GOSUB 6000
LH 5550 W1=5*50
TE 5555 W2=150-W1
ZX 5560 GOSUB 6000
```

```
WS 5565 IF E<1.5 THEN W1=0
PR 5570 IF E>=1.5 THEN W1=INT(ABS(1.5-E)*
   100)
SH 5572 IF E>2.1 THEN W1=50
QY 5580 W2=50-W1
AG 5590 GOSUB 6000
TC 5800 GOTO 7700
JT 6000 FOR Z=1 TO 300:NEXT Z:GOSUB 7500
QM 6070 FOR X=1 TO W2/10
FF 6080 H=INT(RND(0)*4)+1
CY 6090 IF H=1 THEN G1=G1+10
FF 6092 IF H>1 THEN G2=G2+10
EH 6096 GOSUB 7600
LF 6100 NEXT X
PE 6110 FOR X=1 TO W1/10
BS 6120 G4=G4+10
CT 6130 GOSUB 7600
LR 6140 NEXT X
AV 6150 RETURN
GK 7500 FOR X=1 TO 8
GY 7510 POSITION 4,4:? "*RESULTS"
FO 7515 SOUND 0,200,10,10
QM 7520 POSITION 28,4:? "RESULTS*":FOR Z=
   1 TO 15:NEXT Z
VE 7530 POSITION 4,4:? "*RESULTS"
IP 7535 SOUND 0,0,0,0
ES 7540 POSITION 28,4:? "RESULTS*":FOR Z=
   1 TO 15:NEXT Z
MD 7550 NEXT X
BH 7560 RETURN
BK 7600 POSITION 28,9:? G4:SOUND 0,30,10,
   10
PB 7610 POSITION 28,12:? G1
IK 7620 POSITION 28,15:? G2:SOUND 0,0,0,0
BS 7690 RETURN
EJ 7700 G5=G1+G2+G4
XY 7701 S=0
WW 7702 PO=0
DD 7704 IF G1>G5/2 THEN POSITION 5,18:? M
   2$
FI 7706 IF G2>G5/2 THEN POSITION 5,18:? M
   3$
WT 7708 IF G1>G5/2 OR G2>G5/2 THEN GOTO 7
   795
FY 7712 IF G1+G2>G4 THEN POSITION 7,18:?
   M2$;" ";M3$;"         COALITION"
JC 7715 IF G1+G2>G4 THEN GOTO 7797
BH 7731 POSITION 6,18:? M1$;" PARTY ELECT
   ED"
UF 7732 GOTO 7800
VN 7795 POSITION 21,18:? "PARTY ELECTED"
FN 7797 GOSUB 9200:GOSUB 10100:GOSUB 1020
   0
PR 7799 RUN
FT 7800 GOSUB 9200:GOSUB 10100
TI 7810 POSITION 2,1:? #6;"CONGRATULATION
   S"
DJ 7812 POSITION 2,3:? #6;"YOU ARE ELECTE
   D"
FS 7814 POSITION 2,5:? #6;"TO ANOTHER FIV
   E"
YV 7816 POSITION 2,7:? #6;"YEARS IN OFFIC
   E"
UK 7818 ? :? "       PRESS START TO CONTIN
   UE"
GV 7819 GOSUB 13005
TO 7820 IF T=3+INT(RND(0)*3) AND KT<>2 TH
   EN GOSUB 9700
NE 7825 GRAPHICS 0:POKE 756,204:POKE 752,
   1:POKE 16,64:POKE 53774,64
VZ 7830 SETCOLOR 2,0,0:RESTORE 790:SETCOL
   OR 4,0,8
RS 7833 T=T+1
TI 7840 GOTO 760
RH 7850 REM *****************************
NN 7999 REM ***   BUDGET DAY TAXES    ***
AU 8000 POSITION 15,8:? "BUDGET DAY"
RV 8010 POSITION 9,10:? "CATEGORY........
   ..RATE(%)"
JY 8029 POSITION 9,12:? "A.INCOME TAX
    ";IX*100;"  "
SF 8030 POSITION 9,13:? "B.CORPN.  TAX
    ";CX*100;"  "
OQ 8035 POSITION 9,14:? "C.VAT
    ";VX*100;"   "
OS 8040 POSITION 24,15:? "(REVENUE)"
HZ 8050 POSITION 9,16:? "D.TOBACCO TAX
    ◢";TX;"  "
OY 8060 POSITION 9,17:? "E.ALCOHOL TAX
    ◢";AX;"  "
QF 8070 POSITION 9,18:? "F.PETROL TAX
    ◢";PX;"   "
HB 8075 POSITION 9,19:? "G.NO MORE CHANGE
   S"
BX 8076 GOSUB 10000
QX 8080 POSITION 4,21:? "  ENTER PREFIX O
   F TAX TO CHANGE "
GR 8090 INPUT #1,B$:GOSUB 10000
CB 8095 IF B$="G" THEN 8300
ZO 8100 IF B$>"G" OR B$="" OR B$<"A" THEN
    8076
DQ 8110 POSITION 4,21:? "ENTER FUTURE RAT
   E THEN RETURN    "
QY 8130 IF B$="A" THEN INPUT #1,IX:IX=IX/
   100:IX=IX*(IX>=0.01):POSITION 27,12:?
   IX*100;"   "
ZR 8140 IF B$="B" THEN INPUT #1,CX:CX=CX/
   100:CX=CX*(CX>=0.01):POSITION 27,13:?
   CX*100;"   "
XJ 8150 IF B$="C" THEN INPUT #1,VX:VX=VX/
   100:VX=VX*(VX>=0.01):VX=VX*(VX<=0.5)+0
   .5*(VX>0.5)
JE 8155 IF B$="C" THEN POSITION 27,14:? V
   X*100;"   "
TL 8160 IF B$="D" THEN INPUT #1,TX:TX=TX*
   (TX>=0.01):POSITION 27,16:? TX;"   "
BY 8170 IF B$="E" THEN INPUT #1,AX:AX=AX*
   (AX>=0.01):POSITION 27,17:? AX;"   "
TV 8180 IF B$="F" THEN INPUT #1,PX:PX=PX*
   (PX>=0.01):POSITION 27,18:? PX;"   "
CR 8230 GOSUB 10000:GOTO 8080
GR 8300 GOSUB 9222:GOSUB 10000
RD 8305 REM ***************************
EY 8309 REM ***   SOCIAL BENEFITS   ***
DV 8310 POSITION 15,8:PRINT "BUDGET DAY"
IF 8311 POSITION 9,10:PRINT "SOCIAL BENEF
   ITS.....RATE:"
OF 8312 POSITION 5,12:? "A.CHILD ALLOWANC
   E     ◢";FF;"   "
EA 8315 POSITION 5,13:? "B.OLD AGE PENSIO
   N     ◢";GG;"   "
HQ 8320 POSITION 5,14:? "C.UNEMPLOYMENT B
   ENEFIT ◢";HH;"   "
ZA 8330 POSITION 5,16:? "D.NO MORE CHANGE
   S"
YY 8350 POSITION 4,21:? "ENTER PREFIX OF
   BENEFIT CHANGE  "
GT 8352 INPUT #1,B$:GOSUB 10000
QM 8360 IF B$>"D" OR B$="" OR B$<"A" THEN
    8350
GY 8365 IF B$="D" THEN GOTO 8402
MM 8370 POSITION 4,21:? "ENTER FUTURE RAT
   E THEN RETURN    "
NK 8380 IF B$="A" THEN INPUT #1,FF:POSITI
   ON 29,12:? FF;"   "
WR 8385 IF B$="B" THEN INPUT #1,GG:POSITI
   ON 29,13:? GG;"   "
EN 8390 IF B$="C" THEN INPUT #1,HH:POSITI
   ON 29,14:? HH;"   "
BP 8391 GOSUB 10000
TZ 8400 GOTO 8350
FX 8402 GOSUB 9225
BI 8405 RETURN
RJ 8406 REM ***************************
BS 8409 REM ***  BUDGET CALCULATIONS ***
AT 8410 GOSUB 9000
NS 8412 XC=XC+(XC*I)
IU 8415 XB=INT((FA*FF)+(OP*GG)+(U*HH)*52)
EY 8420 XA=INT(XA+(XA*I))
SG 8425 XD=FF+GG+HH
HC 8426 IF XD<=0 THEN XD=1.0E-03
ZM 8430 XP=XA+XB
CD 8440 PP=15*(XD/XC)
GJ 8445 IF PP>15 THEN PP=15
FE 8450 IF XC>XD THEN PP=0
EV 8460 IF AX<=0 THEN AX=1.0E-03
AD 8470 IF TX<=0 THEN TX=1.0E-03
VU 8480 IF PX<=0 THEN PX=1.0E-03
TA 8500 DD=DD+(DD*I)
VP 8502 EE=EE+(EE*I)
RJ 8504 CC=CC+(CC*I)
CT 8510 BS=(295+(T*5))*DD/AX
KK 8515 IF BS>(295+(T*5)) THEN BS=(295+(T
   *5))
NJ 8520 FP=(6000+(T*10))*CC/TX
KP 8525 IF FP>(6000+(T*10)) THEN FP=(6000
   +(T*10))
OX 8530 GS=(6000+(T*50))*EE/PX
AM 8532 IF GS>(6000+(T*50)) THEN GS=(6000
   +(T*50))
IZ 8535 VV=VV+(VV*I)
GU 8550 VT=INT(VV*VX)
CJ 8555 IF VX>0.19 THEN VT=(VT*(0.19/VX))
UX 8560 BS=BS*AX
ED 8570 FP=FP*TX
EY 8580 GS=GS*PX
ZR 8600 TS=INT(BS+FP+GS)
VP 8605 IF AX+PX+TX<0.01 THEN TS=0
FT 8610 SS=INT(200*((DD+EE+CC)/(AX+PX+TX)
   ))
PA 8630 IF SS>190 THEN SS=190
CZ 8632 IF T<9 THEN XV=0.165-(T/100)
OA 8634 XT=(INT(RND(0)*4)+1)*0.01+0.47
KJ 8635 XT=XT-(0.025*T)
AO 8636 IF IX=0 THEN IX=1.0E-03
UG 8637 IF CX=0 THEN CX=1.0E-03
OW 8638 IF VX=0 THEN VX=1.0E-03
XR 8640 CQ=INT(200*(XV/VX))
OS 8650 IF CQ>204 THEN CO=204
IQ 8660 CS=INT(400*(XT/CX))
OF 8662 IF CS>400 THEN CS=400
OD 8665 CO=200+CQ+SS+CS
JC 8668 IF CO>1000 THEN CO=1000
OF 8669 IF CX>0.79 THEN CO=199-(CX*100)
AV 8670 U=25-(CO*25/1000)
FN 8675 U=(INT(U*10))/10
OL 8680 IF U<0 THEN U=INT((RND(0)*3)+1)*0
   .1
NN 8682 AA=AA+(AA*I)
MG 8686 IN=IN+(IN*I)
UP 8690 IA=INT((25-U)*IN*IX)
KZ 8695 IF IX<0.01 THEN IA=0
EG 8700 CI=INT(CO*AA*CX)
JM 8702 IF CX<0.01 THEN CI=0
TD 8705 TT=VT+IA+CI+TS
AP 8707 I=(((TT+XB-(TT*I))/OT)-1)
JF 8708 IF I<0 THEN I=0
GW 8709 I=I+(INT((T*3)+1)*0.01)
NB 8710 L=L+(TT-XP-XZ)
TJ 8715 IF L<0 THEN I=I+(ABS(L)/100000)
JK 8720 E=E-(E*I)
VR 8722 E=E+0.1+(INT((RND(0)*10)+1)*0.01)
XW 8725 E=(INT(E*100))/100
IN 8730 IF E>3 THEN E=3
BO 8740 IF E<0.5 THEN E=0.5
XB 8750 PQ=20-(I*100)
JD 8760 IF PQ<0 THEN PQ=0
YN 8770 PR=25-(U*10)
KN 8780 IF PR<0 THEN PR=0
ZC 8790 P=INT(PO+PP+PQ+PR)
WL 8800 IF IX>0.35+(K/100) THEN B=T+1
MF 8820 IF B>1 THEN P=INT(P/B)
IH 8830 B=B-1
WG 8850 IF GG<(XC/3) THEN P=0
BZ 8990 RETURN
QE 9000 REM *****************************
OP 9020 REM *** ERASE HALF OF SCREEN ***
WM 9200 POSITION 4,21:? "  Press RETURN t
   o continue          "
BO 9210 INPUT #1,B$
FC 9220 POSITION 0,21:? "
                              "
AV 9221 RETURN
```

```
OS 9222 O=12
XI 9223 GOTO 9228
ZS 9225 O=7
AG 9228 FOR X=O TO 22
WG 9230 POSITION 0,X:? "
                              "
LW 9240 NEXT X
BA 9250 RETURN
RA 9260 REM *****************************
XV 9499 REM ***RECALCULATE TOP DISPLAY***
DZ 9500 GOSUB 8412
XW 9505 POSITION 9,2:? T
RI 9510 POSITION 35,2:? Y
MP 9520 POSITION 11,3:? "    "
XZ 9525 POSITION 11,3:? (INT(I*100))
VU 9530 POSITION 32,3:? "  "
ZP 9540 POSITION 32,3:? E
NQ 9550 POSITION 11,4:? "    "
MY 9555 POSITION 11,4:? U
WF 9560 POSITION 31,4:? "    "
JI 9570 POSITION 31,4:? P
LN 9580 POSITION 11,5:? S
EX 9590 POSITION 29,5:? "         "
LZ 9595 POSITION 29,5:? L
CQ 9596 RETURN
SR 9597 REM *****************************
DU 9598 REM ***     PARTY WETS REBEL     ***
DC 9599 RETURN
JF 9600 FOR X=1 TO 10
CK 9601 POSITION 15,8:? "PARTY NEWS":FOR
   Z=1 TO 5:NEXT Z
EX 9602 POSITION 15,8:? "PARTY NEWS":FOR
   Z=1 TO 5:NEXT Z
IA 9603 ? CHR$(253)
MI 9604 NEXT X
PS 9610 POSITION 4,10:? "PARTY WETS HAVE
   REBELLED AGAINST"
QZ 9612 POSITION 7,12:? IX*100;" PERCENT
   INCOME TAX RATE"
RE 9614 IX=0.4+(K*0.02)
DF 9620 POSITION 4,15:? "IT MUST BE REDUC
   ED TO ";IX*100;" PERCENT"
CJ 9622 GOSUB 9200
GM 9623 GOSUB 9225
BT 9625 RETURN
QZ 9630 REM *****************************
OM 9699 REM ***       KNIGHTHOOD       ***
LJ 9700 ? #6;CHR$(125)
YH 9705 KT=2
UB 9706 POSITION 3,0:? #6;"CONGRATULATION
   S"
VG 9707 POSITION 4,2:? #6;"YOU HAVE BEEN"
NL 9708 POSITION 0,4:? #6;"AWARDED A KNIG
   HTHOOD"
AK 9709 POSITION 3,6:? #6;"FOR SERVICES T
   O"
JX 9710 POSITION 4,8:? #6;"YOUR COUNTRY"
MJ 9711 ? :? "     PRESS START TO CONTINU
   E"
GW 9712 GOSUB 14006
BB 9720 RETURN
RB 9730 REM *****************************
VY 9750 POSITION 4,16:? "
                               "
BN 9760 RETURN
GD 9799 REM ***SOCIAL BENEFITS WARNING***
JJ 9800 FOR X=1 TO 10
GE 9805 POSITION 16,8:? "WARNING":FOR Z=1
    TO 5:NEXT Z
HY 9810 POSITION 16,8:? "WARNING":FOR Z=1
    TO 5:NEXT Z:? CHR$(253)
MF 9830 NEXT X
JV 9860 POSITION 3,10:? "SOCIAL BENEFITS
   ARE FALLING BADLY     BEHIND INFLATION
   "
CU 9870 GOSUB 9200
GW 9880 GOSUB 9225
CP 9885 RETURN
RV 9890 REM *****************************
DY 9999 REM ***     ERASE LINE 22      ***
HM 10000 POSITION 0,22:? "
                              "
DB 10010 RETURN
UM 10020 REM ****************************
EI 10099 REM ***ELECTION RESULTS COLOR***
WR 10100 GRAPHICS 2:POKE 712,12
KS 10110 IF K$="A" THEN POKE 708,116
YK 10120 IF K$="B" THEN POKE 708,50
VN 10130 IF K$="C" THEN POKE 708,20
DQ 10140 RETURN
VB 10150 REM ****************************
ET 10199 REM ***     OUT OF OFFICE     ***
ID 10200 POSITION 3,2:? #6;"YOU ARE OUT O
   F"
BD 10210 POSITION 7,4:? #6;"OFFICE"
NQ 10220 POSITION 3,6:? #6;"GO ON-TRY AGA
   IN"
LL 10230 ? :? "     PRESS START FOR A NEW G
   AME"
OV 10240 GOSUB 12005
DX 10250 RETURN
VI 10260 REM ****************************
MA 11000 REM ***     TRAP ROUTINE      ***
TN 11005 EL=PEEK(186)+256*PEEK(187)
RW 11010 FOR Z=1 TO 5
YK 11020 POSITION 0,22:? "INPUT ERROR - T
   RY AGAIN"
VU 11030 FOR X=1 TO 10:NEXT X
VN 11040 POSITION 0,22:? "INPUT ERROR - T
   RY AGAIN";CHR$(253)
WC 11050 FOR X=1 TO 10:NEXT X
OF 11060 NEXT Z
VJ 11070 GOSUB 10000:TRAP 11000:POSITION
   2,22
OS 11080 GOTO EL
VQ 11090 REM ****************************
TT 12000 REM ***THE BARE NECESSITIES***
GZ 12005 RESTORE 12100
XB 12010 FOR VERSE=1 TO 2
KX 12020 FOR DATA=1 TO 141
AA 12025 IF PEEK(53279)=6 THEN RETURN
LB 12030 READ DU,V,P0
PZ 12040 SOUND 0,P0,10,V
KU 12050 FOR DEL=1 TO DU*2.2:NEXT DEL
VF 12060 SOUND 0,0,0,0
PN 12070 NEXT DATA
HG 12080 RESTORE 12100
ZK 12090 NEXT VERSE
EZ 12100 DATA 4,10,121,4,10,96,4,10,91,4,
   0,0,8,10,72,4,10,76
MT 12110 DATA 4,10,72,4,10,81,4,10,91,4,1
   0,91,4,10,81,4,10,91,4,10,81,4,10,91
XT 12120 DATA 4,10,81,4,10,91,4,10,108,4,
   10,121,4,10,91,4,10,121,4,10,91,4,10,7
   2
ZC 12130 DATA 4,10,53,4,10,60,4,10,68,4,1
   0,72,16,10,81
FY 12140 DATA 4,0,0,4,10,60,4,10,53,4,10,
   60,4,0,0,8,10,53,4,10,60
IP 12150 DATA 4,10,53,4,10,60,4,10,72,4,1
   0,91,4,10,81,4,10,91,4,10,81,4,10,91
SH 12160 DATA 4,10,53,4,10,91,4,10,91,4,1
   0,81,4,10,72,4,10,60,4,10,72,4,10,60
EM 12170 DATA 4,10,72,4,10,91,4,10,108,4,
   10,121,16,10,91
TS 12180 DATA 4,10,91,4,10,91,2,10,96,2,1
   0,96,4,10,108,8,10,121,8,10,121
FJ 12190 DATA 4,10,121,4,10,81,2,10,81,2,
   10,91,4,10,96,16,10,91
JY 12200 DATA 4,0,0,4,10,91,2,10,96,2,10,
   96,4,10,108,8,10,121,8,10,81
XB 12210 DATA 4,10,81,4,10,81,4,10,91,4,1
   0,81,16,10,72
VX 12220 DATA 4,0,0,4,10,72,4,10,68,4,10,
   60,4,10,53,4,10,53,4,10,53,4,10,68
YF 12230 DATA 4,10,72,4,10,81,4,10,72,4,1
   0,68,4,10,60,4,10,53,4,10,60,4,10,72
GW 12240 DATA 12,10,81,4,10,91,4,10,72,4,
   10,108,2,10,108,2,10,108,4,10,108
DO 12250 DATA 4,10,72,4,10,108,4,10,108,4
   ,10,108,2,10,68,2,10,68,4,10,68,4,10,0,0,
   2,10,72,2,10,72
LD 12260 DATA 4,10,81,4,10,91,4,10,96,4,1
   0,121,4,10,91,4,10,91,4,10,72,4,10,60
GK 12270 DATA 16,10,53,4,0,0,4,10,72,4,10
   ,68,4,10,60
GZ 12280 DATA 2,10,53,2,10,53,8,10,53,4,1
   0,68,4,10,72,4,10,81,4,10,91,4,10,96
HY 12290 DATA 16,10,91,4,10,91,4,10,96,4,
   10,108,4,10,96
ZQ 12300 DATA 16,10,91,4,10,91
UV 12310 REM ****************************
KY 13000 REM ***DAM BUSTERS MARCH***
LW 13005 RESTORE 13070
YK 13010 FOR DATA=1 TO 56
ZY 13015 IF PEEK(53279)=6 THEN RETURN
CL 13020 READ DU,P0
AQ 13030 SOUND 0,P0,10,10
HQ 13040 FOR DEL=1 TO DU*8:NEXT DEL
VD 13050 SOUND 0,0,0,0
PL 13060 NEXT DATA
FA 13065 RETURN
VB 13070 DATA 4,81,2,60,2,81,2,81,1,91,1,
   96,2,91,2,81,4,96,2,81,2,96
FC 13080 DATA 2,96,1,108,1,121,2,128,2,10
   8,3,121,1,108,2,96,2,72,3,81,1,96,4,81
   ,2,108,2,81
GA 13090 DATA 1,72,1,60,4,64,4,64,2,81,2,
   60,2,81,2,81,1,91,1,96,2,91,2,81
ES 13100 DATA 4,96,2,72,2,96,2,96,1,108,1
   ,121,2,128,2,108,2,121,2,114,2,108,2,9
   6,2,91,2,60
NW 13110 DATA 2,64,2,72,4,96,4,108,2,121
UV 13120 REM ****************************
HY 14000 REM ***NATIONAL ANTHEM***
MT 14006 RESTORE 14070
YK 14007 FOR VERSE=1 TO 2
UH 14010 FOR DATA=1 TO 42
AA 14015 IF PEEK(53279)=6 THEN RETURN
AK 14020 READ DU,V0,P0,V1,P1,V2,P2,P3
DE 14030 SOUND 0,P0,10,V0:SOUND 1,P1,10,V
   1:SOUND 2,P2,10,V2:SOUND 3,P3,10,8
GV 14040 FOR DEL=1 TO DU*7:NEXT DEL
CN 14050 FOR X=0 TO 3:SOUND X,0,0,0:NEXT
   X
PN 14060 NEXT DATA
MX 14062 RESTORE 14070
AO 14065 NEXT VERSE
FM 14066 RETURN
ZZ 14070 DATA 2,0,0,8,60,8,81,96,2,0,0,8,
   60,8,81,96,2,0,0,8,53,8,81,91
GJ 14080 DATA 3,0,0,8,64,8,81,108,1,0,0,8
   ,60,8,81,108,2,0,0,8,53,8,81,91
AK 14090 DATA 2,8,47,8,60,8,81,96,2,8,47,
   8,60,8,81,96,2,0,0,8,45,8,60,72
JL 14100 DATA 3,8,47,8,60,8,81,96,1,0,0,8
   ,53,8,81,91,2,0,0,8,60,8,81,96
TI 14110 DATA 2,0,0,8,53,8,81,91,2,0,0,8,
   60,8,81,96,2,0,0,8,64,8,81,108
EO 14120 DATA 6,0,0,8,60,8,81,96,2,8,40,8
   ,60,8,81,96,2,8,40,8,60,81,8,96,2,8,40
   ,8,60,8,81,96
UL 14130 DATA 3,8,40,8,60,8,81,96,1,8,45,
   8,64,8,81,108,2,8,47,8,60,8,81,96
VG 14140 DATA 2,8,45,8,64,8,81,108,2,8,45
   ,8,64,8,81,108,2,8,45,8,64,8,81,108
DR 14150 DATA 3,8,45,8,64,8,81,108,1,8,47
   ,8,60,8,81,96,2,0,0,8,53,8,81,91
JD 14160 DATA 2,8,47,8,60,8,81,96,1,0,0,0
   ,0,0,45,1,0,0,0,0,0,0,47,1,0,0,0,0,0
   ,0,53,1,0,0,0,0,0,0,60
JH 14170 DATA 3,8,47,8,60,8,81,96,1,0,0,8
   ,45,8,64,81,2,8,40,8,60,8,81,96
MJ 14180 DATA .667,0,0,0,0,0,0,35,.667,0,
   0,0,0,0,0,40,.667,0,0,0,0,0,0,45,2,8,4
   7,8,60,8,81,96,2,0,0,8,53,8,81,91
EA 14190 DATA 6,8,60,8,81,8,96,121
US 14200 REM ****************************
```

17. WOMBATS 1



Not a Wombat!

by Garry Francis

Generally speaking, Adventuring is a serious business. Hacking through steamy jungles, piloting spaceships and whomping monsters are not tasks to be taken lightly. When you step into an Adventure's alternative world, you are putting your alter ego's life on the line. This can be a considerable responsibility, but when combined with the normal challenge and frustration of Adventuring, you realise that the Adventure player is subject to considerable stress. The more Adventuring you do, the more stress you're subjected to!

Because of this, it's nice to occasionally take a break from 'serious' Adventuring by playing an Adventure comedy. By that, I mean one of the light-hearted Adventures that doesn't take itself too seriously and provides a few laughs along the way. Unfortunately, there are very few Adventures that fall into this category. Most Adventures have at least one or two funny responses, but very few are funny throughout. Infocom no doubt comes closest, with games like Planetfall, The Hitchhiker's Guide to the Galaxy and Leather Goddesses of Phobos. The only non-Infocom comedies that come to mind are the classic Soft Porn (from Siera On-Line) and possibly Dragon Quest (from Antic), although these are more spoofs than comedies.

That brings us to the subject of this month's column...

Wombats I is a text Adventure written by Alex Leavens and Shirley A. Russell for Dynamic Software Design, P.O. Box 8169, Fremont, CA 94537, U.S.A. It was first advertised in March 1985, hence it must have been around for about two years, but it's extremely hard to find. I tried a couple of mail order houses in the States and eventually got a copy from Computer Games +, P.O. Box 6144, Orange, CA 92667, U.S.A. for the discounted price of $US24.95 plus postage. However, you can probably buy it direct from Dynamic Software Design for the normal price of $US27.95 plus postage. In either case, write first to check on price and availability.

Wombats I is advertised as a parody Adventure. The ad goes something like this:

> "How to track a wombat:
> - Buy appropriate wombat tracking gear (snowshoes, swimsuit, flashlight).
> - Fly to exotic countrysides (Borneo, Lower Hebrides, Pasaic, N.J.).
> - Get Wombat Tracker's License.
> - Track wombat.
>
> OR: You can simply play Wombats I from the safety and security of your own keyboard. Wombats I is a new kind of Adventure game where the action takes place mostly in your mind. Wombats I is sophisticated software, sporting 48k of program and 55k of absurd, irreverent text. Wombats I spoofs Adventure games and life in general..."

What a load of rubbish!

Firstly, a parody is a humorous imitation of another author's composition, which this isn't. So what is it? Travesty? Spoof? Satire? Lampoon? Comedy? Farce? I'd call it a travesty (which makes a thing look ridiculous by grotesque representation) or better still, a farce (a dramatic work meant merely to cause laughter, often by presenting ludicrously improbable events).

Secondly, a wombat is a small, bear-like, herbivorous marsupial which is native to Australia. There's no way you'd track one down using the suggestions in the ad, but I'll excuse this as ignorance or 'artist's license'.

Thirdly, the title is misleading as there is absolutely no reference to wombats within the game itself!

Fourthly, the technical claims are downright lies! It is NOT a new kind of Adventure or sophisticated software, but a primitive, compiled BASIC program with a limited vocabulary and a poor parser. And how does 103k fit on an 88k disk? Simple. It doesn't! The disk has 38k of program and less than 29k of text files – a total of 67k.

To add to the false impression created by the advertising, the game is subtitled 'Episode I: Gazumba the Great and the Wombats of Borozoa'. This implies that there is an Episode II, which there isn't. (It was advertised once, but it doesn't appear to have become a reality.) There is also no such character as Gazumba the Great encountered in the game and no such place as Borozoa? And what's this obsession with wombats anyway?

I don't know what the authors are trying to achieve here, but I felt terribly disappointed once I'd played the game and discovered that it bore absolutely no resemblance to the advertisement which had prompted me to buy it in the first place!

Having gotten that off my chest, let's forget about the authors' motives and look at the game itself.

The Review: Wombats I supposedly takes place on the remains of a college campus – although the majority of

locations have nothing whatsoever to do with an educational institution. A mental institution, maybe, but definitely not an educational institution.

You will encounter rooms like a behavioural science lab, a restaurant with a dead maitre d', a waterfall of light, an auditorium, a discotheque, an electronics lab, cloud cuckoo land and much more. Each room has a long and colourful description like in an Infocom game. For example, the starting room (known as the compass room) is described as follows: "You are standing in a large room with exits in all four directions. There is an ornate compass laid in multicoloured tiles on the floor and a large, lightly lit globe hangs overhead. The room is warm and the soft purr of an air filter can be heard in the distance."

The aim of the game is to find the nine treasures scattered throughout the complex and return them to the compass room. In doing so, you must also visit every room in the complex and carry out certain obscure actions to earn points. When your score reaches 342 points, the endgame room is activated. You must then find this room to be awarded the last five points, thus completing the game with a perfect score of 347 points.

Now this may not sound too hard, but consider this. There are only ten objects in the whole game and nine of these are the treasures! Most of the treasures are of little or no use except in gaining points. The remaining object has one use and one use only! Combine all this with a somewhat specialised vocabulary, a barely adequate parser and some really obscure actions and you have a hard game!

Bugs: Unfortunately, Wombats I also has some bad spelling and quite a few bugs. Here's a few examples:

- The blurb about the electronics lab describes two objects which can be taken. However, when they ARE taken, they still appear in the description even though they're not really there!
- If you try to type anything on the computer after it's blown up, you're told how pointless that is, seeing as the computer is a smouldering pile of rubble. Fair enough. However, you get the same message even BEFORE the computer blows up!
- Starting the car is random and can take anything up to 20 (and possibly more) tries without indicating that you should try again. If you didn't know to keep trying, you'd give up after the first go!
- You can solve the equation in the classroom without even knowing what it is!
- If you visit the area around cloud cuckoo land more than once, you can get extra points and even finish the game without ever finding the endgame room!
- The parser gives lots of funny errors, but one that tickled my fancy was when I said EXAMINE THEATER. The program replied "I don't know the word TER". It thought that both 'THE' and 'A' were definite articles despite the stupid syntax and lack of spaces.
- If you accidentally RESTORE a game with a bad disk, it asks "Is disk okay?". Subsequent RESTOREs cause "Game error occurred. Error is 133. Line is 0 Do you wish to retry?". Type 'Y' and it doesn't work. Type anything else and the program locks up.

Game Playing Strategy: The overall strategy required for Wombats I is not all that different to that required for other Adventures, but you must be much more thorough.

Every time you enter a new room you are given a lengthy room description. Start out by identifying all the nouns in the room description. For example, in the description of the compass room quoted above, the nouns are 'room', 'exits', 'directions', 'compass', 'tiles', 'floor', 'globe', 'filter' and 'distance'. To this list of nouns, always add 'wall' and 'ceiling'. Now systematically try to EXAMINE and READ every noun on the list regardless of how irrelevant it seems. You will often get a humorous response and may be awarded some points into the bargain! Note that LOOK AT is usually synonymous with EXAMINE, but there is at least one notable exception. EXAMINE and READ are also synonyms in some situations, but not others. Make sure you try both! For example, EXAMINE DIPLOMA and READ DIPLOMA give the same response, but EXAMINE BOARD and READ BOARD give two entirely different responses. One earns points and one doesn't.

As you work through the list, you will more often than not be told that the noun is not understood. Be persistent. Don't skip verb/noun combinations as you'll sometimes find that a noun is understood when you EXAMINE it, but not when you READ it and vice versa.

Once you've exhausted the list of nouns, try to GET any object that seems moveable. You'll often get an error message, but sometimes you'll get a funny response and you may even discover a treasure! If the noun turns out to be a moveable object, EXAMINE it and READ it again after you've picked it up. You nearly always get different responses when you EXAMINE and READ moveable objects.

Finally, try every other verb you can think of that has any relevance to each of the nouns. For example, if you find a lamp (and you won't), you can try to light it (LIGHT, BURN, START, TURN ON), extinguish it (EXTINGUISH, UNLIGHT, TURN OFF), empty it (EMPTY, POUR, SPILL), fill it (FILL, REPLENISH, REFILL, REFUEL), further examine it (SHAKE, LISTEN TO, TOUCH, FEEL) or do the Aladdin thing (RUB, WIPE, WASH, CLEAN, SHINE). Get the idea? Only when you've exhausted every possibility should you move on to the next room.

As you explore the complex, make sure you draw a map. Don't assume that if you go north from one room, you can return by going south. More often than not, you can't! There are lots of twists and turns and one-way passages. In fact, it's a real *@!?# to map in a clear and consistent manner.

Finally, here's a few miscellaneous tips to help you on the way.

If you find any living creatures in the complex (and I use the term loosely), try talking to them and giving them things. You'll get some really funny responses if you do. The alien is particularly helpful! Quote him word for word!

Don't worry too much about trying to catch the droid until you're in the right room. There's a hint in the instructions which explains where that is (but ignore the hint about the movie).

There is no time limit and no limit on the number of items you can carry, so carry everything you can until you've found all the treasures.

Scoring: While all this is going on, you must keep a very careful eye on your score. Type SCORE every time you enter a new room and every time you get a meaningful response from the program. Points are sometimes awarded for the most obscure actions and only by constantly checking your score will you be able to determine what actions are essential to finish the game. Remember that you cannot get to the endgame room to complete the game unless you have a perfect score!

continued overleaf

Points are awarded as follows (the list is deliberately vague to avoid giving too much away):

5 points for visiting each of the 36 rooms for a total of 180 points
10 points for returning each of the 9 treasures for a total of 90 points
10 points for starting the car
10 points for playing the record
10 points for saying the magic phrase
7 points for reading the book
5 points for feeling the alien
5 points for reading the bulletin board
5 points for examining the papers
4 points for pulling the handle
4 points for examining the diploma
4 points for examining the frescoes
3 points for looking in the mirror
3 points for pressing the switch
2 points for examining the compass
2 points for reading the magazine
2 points for examining the plaque
1 point for solving the equation
---
347 points total

You also lose 20 points if you get killed.

Cheat's Corner: If you've followed my advice so far and you still can't finish the game, then it's time to cheat! When I play an Adventure, I always try to finish it by myself without any outside help. If I get really stuck, I'll resort to a sector editor (or something similar) to scan the disk and hopefully come up with some ideas to help overcome the current stumbling block. In cases where the text is compacted or encoded in such a way that it is not easily recognisable, I'll turn to my large collection of magazine articles, hint sheets, hint books or whatever else is available. When there's no published material to help, then it's all out war! It's me versus the programmer – anything goes and no holds barred! All's fair in love and war...and solving Adventures.

In the case of Wombats I, I was about half way through the game and had come to a dead end. I was finding it reasonably frustrating up until that point and was ready to resort to a sector editor. At about the same time, the disk developed an intermittent bad sector and would sometimes fail to load. I hadn't made a backup because of the copy protection and was worried that if I returned the disk for a replacement, I might never see it again.

At that point, I decided to crack the copy protection, make a backup copy and examine the disk at my leisure without having to bother about bad sectors, funny formats and so on. This turned out to be more fun than playing the

```
CS 1 REM ###########################
RA 2 REM # TEXT DECODER FOR WOMBATS I #
SA 3 REM #       by Garry Francis     #
UP 4 REM #  PAGE 6 Magazine - England #
CW 5 REM ###########################
HI 10 GRAPHICS 0:DIM F$(15),TEMP$(8):F$="
   D1:"
JQ 20 TRAP 20:POSITION 2,19:? "ENTER FILE
   NAME TO DECODE":? "DO NOT SUPPLY EXTEN
   SION":? :? CHR$(156);"D1:";:INPUT TEMP
   $
YQ 30 F$(4)=TEMP$:F$(LEN(F$)+1)=".TXT":TR
   AP 50:OPEN #1,4,0,F$:GRAPHICS 0
SH 40 GET #1,A:? CHR$(A+1);:GOTO 40
RY 50 CLOSE #1:GOTO 20
```

Adventure itself and revealed some very interesting things.

The disk is not an autoboot disk as I would have expected, but a plain old ordinary DOS disk with a custom format on the first three tracks and a few stray bad sectors. It contains a version of DOS XL licensed from Optimised Systems Software, an AUTORUN.SYS file containing the compiled BASIC program, a whole heap of coded text files and a short data file called DMA.DAT. The latter contains decimal numbers for a machine language routine read in by the main program.

If you'd like to examine any of these files, you'll have to start out by making a non-executable, working copy of the original disk. This is easily achieved by copying sectors 1-9, 11-19, 21-39, 41-59 and 61-629 from the Wombats I disk to your own freshly formatted blank disk. (All these numbers are in decimal. All you hex freaks should use sectors $01-$09, $0B-$13, $15-$27, $29-$3B and $3D-$275.) You can actually use the working disk to load the program, but it will NOT run because it has not duplicated the bad sectors and funny format of the original. Hence the working disk is useless except for examining files.

Wombats I uses a hidden directory. This is located in sectors 370-377 and can be 'unhidden' by copying it back to its proper place at sectors 361-368. (Again this is in decimal. Hex freaks should copy sectors from $172-$179 back to $169-$170.) You can now load DOS, get a directory and use the DOS copy function to copy files to the screen. When copying the text files, you'll see that they are full of gobbledegook. That's because they've been coded to keep out prying eyes. Fortunately, it's only a simple transposition cipher. If you increment the ASCII value of each character, you'll get the proper ASCII value, thus @ becomes A, A becomes B, B becomes C and so on. This would be a pretty tedious job to do manually, so you can use the accompanying program to make life easier .

The Endgame: With all the game playing strategy and tidbits in Cheat's Corner, you should have no trouble completing the game. When you've reached the endgame room, you get to fill out a card included in the package and send it off to Dynamic Software Design for your Official Wombat Tracker's Certificate and a special surprise. I'm not sure what the special surprise is (as I haven't sent my card off yet), but I'm certainly curious to find out.

Conclusion: I feel that the advertising of Wombats I is a bit misleading, as it isn't really a parody or a comedy, but more of a farce. Nevertheless, if you've got a really warped sense of humour, I'm sure you'll get a lot of laughs out of Wombats I. Try playing it with a group of friends to get the most fun from it. (And try swearing at it!) Once the initial novelty wears off and your friends have gone home, you'll find that the game is extremely tedious. It's got a lot of bugs and needs a lot of patience to play, hence I can only recommend it to dedicated Adventurers with a broad mind and a lot of previous experience.

As usual, if you have any questions or comments or you need a hint on a specific Adventure, please feel free to write, but don't forget to include two international reply coupons if you expect a reply.

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WRITE IT!

You don't need 16 bits for word processing.Rob Anthony explains how you can get all you need from an Atari 8 bit system.

Few people, it seems, realise quite how powerful Atari 8 bit computers are when it comes to word processing. They are, potentially, even better than the Amstrad word processor, as that machine can only handle one printer. The Atari system has the ability to address documents to any of 8 printers, which can all be turned on and waiting. I have 3 on-line at any one time, they are the 1027, the 1029 and the XMM801. When using Basic or SpeedScript (from Compute!) I can address my documents or listings simply by using either "P5:" for the 1027, "P6:" for the 1029 or "P7:" for the XMM801 (incidentally, this trick doesn't work with the older 400/800 models, but the 850 interface does support the facility, showing Atari's forethought). The 850 interface responds to "P1:", so it can be used for a third party printer using the serial or centronics ports.

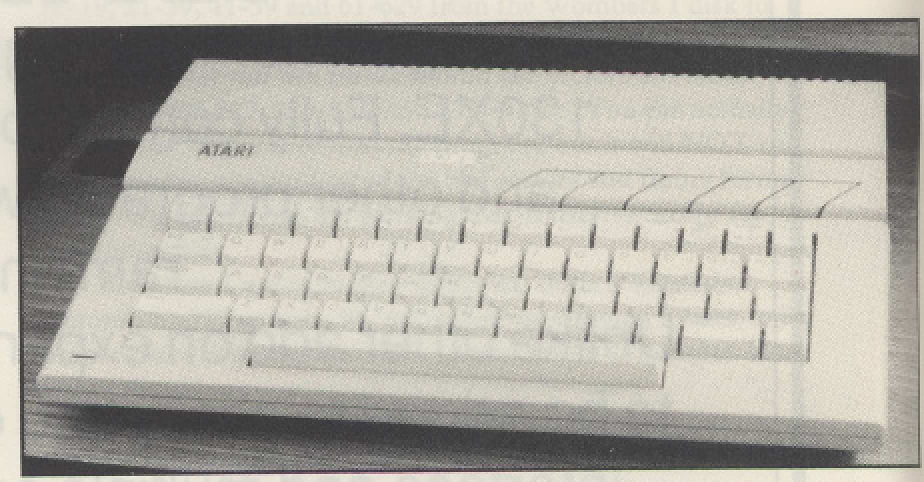
This versatility could be very useful but, unfortunately, very few word processing programs recognise the facility. This is possibly due to the fact that the 400/800 models were restricted, although it could be due to the fact that few third party printers use the same control codes for their various functions. All the Atari printers however either use or ignore the same codes, so I can see no reason why future programs should not be designed to include the feature.

Another feature lacking on most word processors is the International Character Set (ICS). I do not understand why it is not included as standard on all word processing programs. In fact I know of only one, SuperScript, which does support the ICS although SpeedScript can be modified (my version has been changed to not only do this, but also to use the 130XE Ramdisk, enabling me to hold several document files in memory at once). Anyway, let's start at the beginning.

WHAT IS A WORD PROCESSING PROGRAM?

Quite simply it is a program which will allow you to use a computer to create, edit and print text in a more flexible fashion then a normal typewriter. It enables you to create a document which can be changed as often as you like. It will also allow you to store that document on some form of recording media so that you can recall the document at a later date and edit it still further.

A good word processing program will allow you to chain document files together, allowing you to write the 'Great British Novel' and print it all out in one go. This is achieved in one of two ways. AtariWriter, for example, prints the first file very quickly, but then loads from any chained files one buffer full at a time, keeping the disk drive active. Others print the first file, then erase it and load the next file in total. This second method is much better as it allows you to spread your document over several disks, but you do have to be vigilant otherwise the program will stop printing with an error if it can't find the next file in the chain!



Better than the Amstrad?

Most programs will automatically number the pages for you, at your request, and will also allow you to put headers or footers (which can include the automatic page number facility) on each page, containing any text you might want repeated there. You can also ask them to start the page numbering from anywhere, or even ask them to start with any number you choose.

Another facility which is pretty vital is the ability to give you a preview of the printed document on the screen. This is a very definite requirement in my case, I simply do not have the time to wait for a printer to finish printing a page and I usually have to tidy up the output so that I don't end up with headings on one page and relevant paragraphs on another. Another reason for this facility is that most programs insert a character in the text (several in some cases) to represent such facilities as underlining and bold print etc. If you are trying to tabulate your text under column headings then you will have to make allowances for these characters, which are not printed on paper. The only way to do this without a preview would be to count the number of extra characters on the screen and subtract that number of extra characters from the position of the columns. The best way to check you have done it correctly is to immediately preview the page you are working on.

If your program can't centre text automatically, then you will have to do some mathematics to work out how many spaces you need before the text you want centering, so if the program can do this for you, it can save you quite a bit of time.

Almost every word processing program can right-justify your text, so that the left and right margins are equal. This involves putting extra spaces between some of the words to space them out a little better. To do this yourself would be very tedious, and most people wouldn't bother.

All word processing programs come with some sort of manual. Some of these are better than others, but they usually

explain what the program can do, and how to do it, with a reasonable degree of clarity. Some of these manuals are paperback, small and difficult to hold open when you are trying to type a document, others are spiral bound, which is much better. The AtariWriter manual is stored on the flip side of the diskette, which is one idea that could save manufacturers a fortune in printing. It also allows you to print the manual in any way you prefer. You could even edit it to clarify some of the more obscure points.

Word processing programs are, necessarily, very sophisticated and because of this there are good and bad programs, but they are all useful, even if all you want to do is write to friends and relatives.

Some word processing programs will also allow you to change the type of printer you want your document to be printed on, allowing for a greater variation in print styles. I find this facility most important as I run a word processing service, using the Atari system exclusively, and the ability to change printers means I can offer my customers a draft quality printout, which they can then change if they wish and return to me for editing and printing in final, letter quality, form later.

WHAT IS A PRINTER DRIVER?

This is a part of the word processing program, usually stored and loaded separately. The program uses this as a sort of template to enable it to use a printer of your choice. Some are more superior than others in this respect, as a number of the less powerful programs store a selection of printer configurations within the main body of the program, which limits the scope of the program and also takes up room in the computers memory, reducing the amount of text you can edit in any one document.

Some programs come with a method of creating your own printer driver, which allows you to add more printers to its repertoire. If you want to create your own driver then you will have to have the printers manual close to hand. The PaperClip printer drivers are very sophisticated, allowing you include such fanciful things as microspacing. It does this so you can include pictures and other goodies in your documents. This does mean you will have to read and understand your printers manual quite well, but if you belong to an Atari user group you will usually find someone who knows all about printers and they will be able to help you. If you use the same word processing program they may even be able to supply you with a custom made driver.

THE PROGRAMS

There are, or have been, numerous word processing programs on the market and therefore I can only mention a few of my particular favourites.

SpeedScript first appeared in Compute! magazine a couple of years ago, but its success prompted them to release it in book form (a disk is available direct from Compute!) which requires you to type it out, using their successful MLX program, which is also printed in the book. The book also contains the source code, which will be of interest to machine language programmers. Since publishing the book, Compute! have continued to support the program with the publication of a character set editor and support program, which allows you to design your own character set. I have changed mine to include the ICS and other characters which are available on Atari printers, including the arrow keys. This program is extremely flexible, it allows you to print to any device, including the screen, editor, disk and cassette recorder. Its files are DOS 2/2.5 compatible so most other programs can load them. Its downfall is that it can't right-justify text, which is quite a serious omission. Also it can't scroll the text, so checking where to put new page markers can be a little tedious.

AtariWriter has a few problems, the program (at least the early versions) doesn't support the ICS, but there are various tricks, which involve embedding control characters in the text, that will at least allow you to print the characters. You can't have more than one printer on line at any one time but, with AtariWriter Plus, you have a good range of printers to select from. Commercially produced drivers are available, which help increase the scope of the program. AtariWriter has a host of features built in, but nothing you shouldn't expect from a good word processor.

HomeWord is another word processing program which cannot readily access the ICS, although you can insert ASCII characters anywhere in the text. An unusual program this as it uses icons on the bottom half of the screen to access the various functions. When entering text a graphic description of the page you are on is illustrated in the bottom right hand corner. This is very helpful, but even more helpful is the preview facility. It is the only program I have come across which allows you to preview a document in 80 columns, all on screen at once. To achieve this it uses a tiny, half size, character set, which is quite readable even on a colour T.V., a major plus point this. Unfortunately it does not appear to have a very good selection of printer drivers although this, again, may be due to the fact that I have an early version. I like this program, even though the files are not standard DOS. I strongly recommend 2 or more drives (maybe newer versions will allow use of the Ramdisk) as all the major functions are stored on the HomeWord master disk. This too I approve of as it allows the programmer to pack sophistication into a relatively small amount of memory, although it does mean extra wear and tear on the disk, which is copy protected. It may surprise you to learn that most commercial programs in the business world are made up of separately loadable subroutines, even though it can slow down the operation of a particular application. Perhaps the programmers of HomeWord would like to take up my earlier suggestions as this program has great potential.

continued overleaf



Two of the best programs

PaperClip is probably the most sophisticated word processor you will find, and if you don't intend to prepare any foreign letters, or write about money then I can tell you this is the program for you. The files are standard DOS compatible. They have managed to achieve this by insisting you plug in a 'dongle', which sits in a joystick port. This also gives you the advantage of being able to back-up the entire master disk, store it away in a safe place and work from the back-up – very commendable. One particular feature which stands out, is that it has the facility to take a file from disk and print this absolutely as is, including all, if any, control characters. When that has finished it will continue to print the current document. This is terrific if you have a spread sheet file you want to include, or even a koala graphics picture. Included on the disk are 25 different printer drivers, and there are also lots of other little goodies, like a separate, stand alone, screen dump program, which takes advantage of the sophisticated printer drivers. There's also an AtariWriter to PaperClip conversion program and a program which will help you create a printer driver to suit your own printer in the unlikely event that one isn't there already. Probably the best program on the market at the moment, but it's a shame about the missing ICS. Newer versions also support the extra memory of the 130XE.

SuperScript is my current favourite. It handles the ICS as though it were second nature, the characters are included in its own character set, so when you want a '£' sign you get it on the screen. It comes with a spelling checker, a must in my business, and, like PaperClip, it can do simple math for you. My version has 11 printer drivers. To help you create new ones you can load one as a text file and edit it with the word processing program itself. When editing text the program uses menus at the top of the screen to help you insert printer commands, such as underlining, and access the various functions of the program itself, like search and replace. You can by-pass the menu by using the first letter of each command, or by assigning keys to do a selection of previously defined keystrokes. The program will automatically load the printer driver of your choice if this is named 'DEFAULTS' on a new disk. The files are fully DOS 2/2.5 compatible, so you should have no problem if you want to use its files on other DOS compatible programs. I personally find this program to be the best for my purposes, and this article was written using it.

THE ATARI PRINTERS

As I mentioned earlier the Atari XL/XE range of home computers are the only ones which can support a battery of printers. Although they can't output to them all at the same time, you can address your document or listing to any one of your choice. Again, there are limitations. You can't change the address of a printer as you can with a disk drive, by moving a switch on the rear of the device, but you can connect, say, 3 different Atari models and, by using the 850 interface, 1 third party model of your choice. I think here would be a good place to discuss some tips which will help you get the best from your Atari printers.

The Atari 1027 is the current Atari letter quality printer, although SuperScript has a printer driver for an XDM121, which I presume Atari will release in the future, probably when the current stocks of 1027 are depleted. Remember the XMM801 suddenly appeared on the market without any advanced warning or advertising whatsoever *(and then suddenly disappeared! Ed.)*.

To get the best from my 1027 I use a left margin of 7 and a right margin of 67. This allows me to insert A4 paper flush with the left edge of the paper guide. If you don't do this the paper will swivel, making the print slant down the page, giving a greater gap at the bottom right of the page, than at the bottom left! The 1027 does not support bold, enlarged, condensed or sub and superscripted characters, nor will it double strike. It does support the ICS, but does not have an alternative font, although I can see no reason why a replacement font could not be manufactured as the print head roller is held on by 2 tiny philips screws. I suspect, however, that potential sales of such a replacement would be to small to warrant manufacture. Although the 1027 doesn't support these extra facilities, it will ignore any commands it receives from the computer requesting these facilities, so it is possible to use the XMM801 or 1029 printer drivers without fear of the machine going into spasms. It is not possible to load more than 1 sheet of paper at a time into the 1027 as it strikes the paper from behind, forcing it against the relevant character on the roller. To enable it to run a little faster it will print bi-directionally, but it isn't logic seeking. A line of text is exactly half a centimetre deep, so it's possible to measure any gaps in your text to enable you to insert charts or photographs, simply by counting the number of RETURN's you need to type. I also recommend a few bottles of Rexel ENM ink, which you can use to replenish the roller.

The Atari 1029 printer is very definitely a dot matrix, low quality, printer. I use it only for screen dumps and free draft quality printouts. My customers complain that it is difficult to make out certain characters sometimes, and it does require it's own printer driver. It supports elongated text and the ICS. In its favour it is quite fast and because it has a tractor paper drive it can be left alone to print a document without intervention. I can't give you much in the way of tips, except that you can get ribbons quite cheaply from Boots, although I think there is less ribbon inside them then the standard ones. The ribbons don't last very long, so it is a good idea to get them re-inked, and there are one or two services advertising this at a third of the cost of a new ribbon.

The XMM801 is, without doubt, the best all round performer in the Atari range. Based on the Epson range of printers, it supports all the normal facilities. It can print in expanded and condensed styles, and can even combine the two to give a slightly larger than normal font. It supports microspacing and proportionally sized characters and has two independent fonts – Pica & Elite. It has an alarm buzzer, which can be sounded by sending the proper character. It is potentially better at doing screen dumps then the 1029, but I haven't been able to work this out yet. If you buy the ST version of this printer, you could connect it via an interface and have access to italics and a few other little bits and pieces. If you want a good all-rounder then this is the printer to get, but if you want to do serious word processing I would suggest you get a decent letter quality job as well. Don't use a fabric or nylon ribbon replacement, the first time I tried it, at the request of my dealers as they had no carbon ribbons in stock, it jammed the print head. The printer was immediately replaced.

CONCLUSIONS

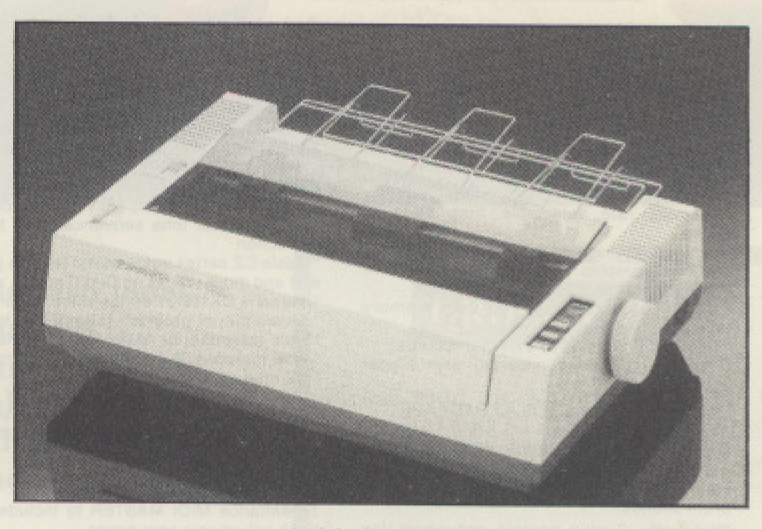
I have not found a better home computer for word processing than the Atari XL/XE range. The unique input/output structure of the operating system makes them enormously flexible. That same input/output architecture ensures that you have tremendous graphics facilities as well.

If you already own an Atari computer, but are thinking about buying a separate machine, then don't. By careful selection of printers and programs you can do word processing, commercially, at home or in the office more than satisfactorily. As most programs allow you to include files from other applications you have great flexibility. Remember that your Atari computer has literally thousands of programs available, and a lot of these are fully professional business programs. Select a good retailer and you will have no problems for many years to come.

Atari computers do not become redundant. Atari has a policy of upward compatibility in its 8 bit range, so a computer bought today will still run, with only 1 or 2 exceptions, all the software written for the original 400/800 machines. No other manufacturer can make this claim, although a few are now beginning to catch on.

In America hard disk drives are now available, and I can see at least one or two crossing the great divide. Certainly, if they are cheap enough, I will buy one.

Another thing to bear in mind is cost. At the time of writing, the 130XE costs just £130, the disk drive another £130. The Atari 1027 will also cost you £130, but Silica Shop will sell you a package for £349. Add, say, the XMM801 at £175 and you could have a two printer set up for less than £525. The 800XL computer/disk package is still available from a few Currys/Dixons shops for under £120, so you see you could get a working system much more cheaply. A very good value third party printer to look for is the Quendata DWP 1120 (available from Twillstar), which has a standard centronics port and optional tractor/single sheet feeder for only £169, add an interface and your finished print quality will be outstanding.



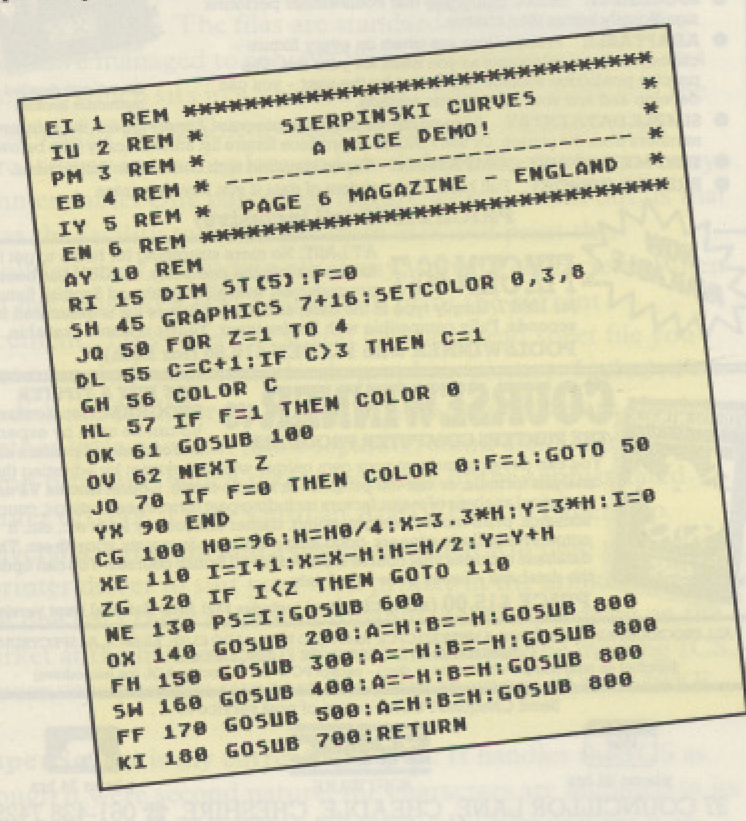
A third party printer might be better?

If you want to get into the business of word processing then remember that the finished print quality decides how well you do, presentation is the all important factor. Most customers couldn't care less what you do it on, but do care what their document looks like.

Demos

Here's one of those 'nice little demos'. This one was sent in some time ago by Allan Sharpe on behalf of the Brighton Users Group. It might look a bit long but you'll enjoy it, especially if it runs first time!

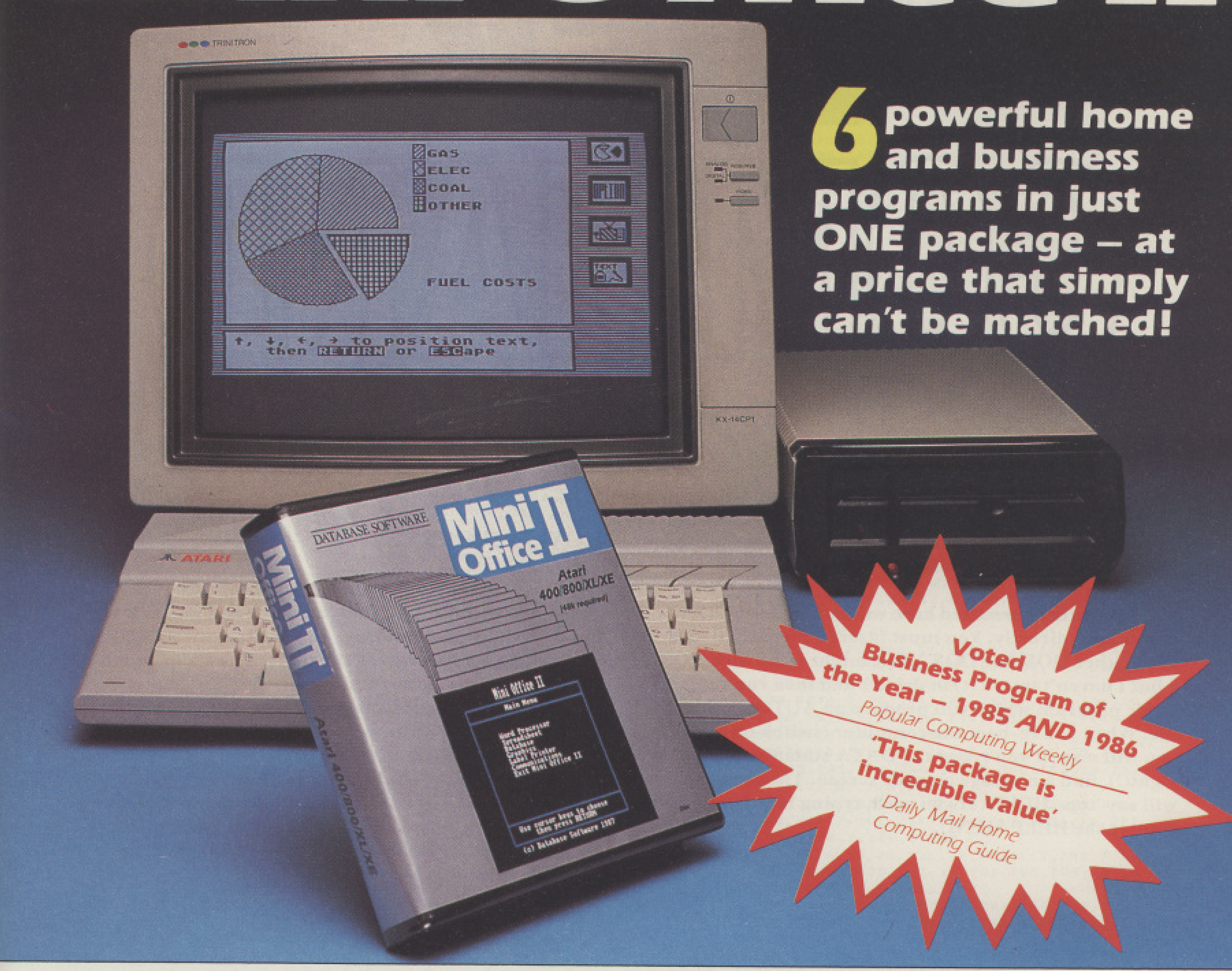
SIERPINSKI CURVES



```
EI 1 REM ********************************
IU 2 REM *      SIERPINSKI CURVES       *
PM 3 REM *         A NICE DEMO!         *
EB 4 REM * ---------------------------- *
IY 5 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EN 6 REM ********************************
AY 10 REM
RI 15 DIM ST(5):F=0
SH 45 GRAPHICS 7+16:SETCOLOR 0,3,8
JQ 50 FOR Z=1 TO 4
DL 55 C=C+1:IF C>3 THEN C=1
GH 56 COLOR C
HL 57 IF F=1 THEN COLOR 0
OK 61 GOSUB 100
OV 62 NEXT Z
JO 70 IF F=0 THEN COLOR 0:F=1:GOTO 50
YX 90 END
CG 100 H0=96:H=H0/4:X=3.3*H:Y=3*H:I=0
XE 110 I=I+1:X=X-H:H=H/2:Y=Y+H
ZG 120 IF I<Z THEN GOTO 110
NE 130 PS=I:GOSUB 600
OX 140 GOSUB 200:A=H:B=-H:GOSUB 800
FH 150 GOSUB 300:A=-H:B=-H:GOSUB 800
SW 160 GOSUB 400:A=-H:B=H:GOSUB 800
FF 170 GOSUB 500:A=H:B=H:GOSUB 800
KI 180 GOSUB 700:RETURN
```

```
PE 200 IF TP<=0 THEN RETURN
YG 220 PS=TP-1:GOSUB 600
OW 230 GOSUB 200:A=H:B=-H:GOSUB 800
OE 240 GOSUB 300:A=2*H:B=0:GOSUB 800
FC 250 GOSUB 500:A=H:B=H:GOSUB 800
RK 260 GOSUB 200
KH 270 GOSUB 700:RETURN
PF 300 IF TP<=0 THEN RETURN
YH 320 PS=TP-1:GOSUB 600
FF 330 GOSUB 300:A=-H:B=-H:GOSUB 800
DH 340 GOSUB 400:A=0:B=-2*H:GOSUB 800
PB 350 GOSUB 200:A=H:B=-H:GOSUB 800
RW 360 GOSUB 300
KI 370 GOSUB 700:RETURN
PG 400 IF TP<=0 THEN RETURN
YI 420 PS=TP-1:GOSUB 600
ST 430 GOSUB 400:A=-H:B=H:GOSUB 800
FW 440 GOSUB 500:A=-2*H:B=0:GOSUB 800
FK 450 GOSUB 300:A=-H:B=-H:GOSUB 800
SI 460 GOSUB 400
KJ 470 GOSUB 700:RETURN
PH 500 IF TP<=0 THEN RETURN
YJ 520 PS=TP-1:GOSUB 600
FB 530 GOSUB 500:A=H:B=H:GOSUB 800
NU 540 GOSUB 200:A=0:B=2*H:GOSUB 800
SY 550 GOSUB 400:A=-H:B=H:GOSUB 800
SU 560 GOSUB 500
KK 570 GOSUB 700:RETURN
BO 600 SP=SP+1:ST(SP)=PS:TP=PS:RETURN
WR 700 SP=SP-1:TP=ST(SP):RETURN
RZ 800 PLOT X,Y:DRAWTO X+A,Y+B
UV 820 X=X+A:Y=Y+B:RETURN
```

Mini Office II



P6

DISK COMMAND

by Nicholas Higgs

Disk Command is a set of new commands that you add to BASIC or ASSEMBLER to assist in editing your programs.

The listing presented here will not give you the new commands directly. You must insert a formatted disk with either DOS 2 or DOS 2.5 (it might work with DOS 3 but I haven't tested it) in drive 1 and then run the Basic program which will produce an AUTORUN.SYS file. When you re-boot the computer (switch on and off) you will now, if you typed the DATA statements right(!), find a message on your screen. The message will say 'type HELP'. If you wish, typing HELP will display the HELP MENU.

HOW IT WORKS

The machine code program interrupts the Get-byte routine of the Screen Editor and points it to the Disk Command routine. This waits until RETURN is pressed and then checks the table of new commands before resuming its normal routines.

The program protects itself from being overwritten by your programming by moving up MEMLO (743,744) and storing itself beneath it. It also interrupts DOSINI (12,13) so that when you press SYSTEM RESET it re-runs. The machine code is less than 3K in length and because the commands are table driven it shouldn't be very difficult to add extra commands as necessary.

```
EI 1 REM ********************************
JE 2 REM *         DISK COMMAND         *
LR 3 REM *              by              *
HD 4 REM *        NICHOLAS HIGGS        *
EC 5 REM * ---------------------------- *
IZ 6 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EO 7 REM ********************************
NN 8 REM
KO 10 GRAPHICS 18:POKE 87,0
AC 20 ? :? "INSERT DOS DISK"
ID 30 ? :? "    then hit":? "    return"
DI 40 CLOSE #1:OPEN #1,4,0,"K:":GET #1,KE
   Y:CLOSE #1:IF KEY<>155 THEN 40
ID 50 ? "K↓   CREATING":? "↓  AUTORUN.SYS
   ":? "      file"
BK 60 OPEN #1,8,0,"D:AUTORUN.SYS"
GC 70 FOR A=1 TO 2304:READ DA:PUT #1,DA:P
   OKE 708,DA:NEXT A
SQ 80 CLOSE #1:GRAPHICS 0:? "↓↓▸   <<FINI
   SHED>>":? "▸SAVE THIS PROGRAM":? "THEN
    SWITCH MACHINE OFF & ON"
YX 90 END
DL 100 DATA 255,255,0,31,241,39,165,12,14
   1,22,31,165,13,141,23,31,169,21,133,12
   ,169,31,133,13,24,144,3,32,37,31,169
CZ 110 DATA 251,141,231,2,169,39,141,232,
   2,32,38,31,96,162,112,160,36,32,1,33,1
   73,36,228,24,105
ZA 120 DATA 1,141,114,31,173,37,228,105,0
   ,141,115,31,160,0,185,0,228,153,116,31
   ,200,192,17,208,245
NC 130 DATA 173,4,228,24,105,1,141,135,31
   ,105,0,173,5,228,141,136,31,169,116,14
   1,33,3,169,31,141
PX 140 DATA 34,3,169,133,141,120,31,169,3
   1,141,121,31,96,76,226,246,0,0,0,0,0,0
   ,0,0,0
VR 150 DATA 0,0,0,0,0,0,0,0,0,32,226,246,
   8,201,155,240,2,40,96,142,234,32,140,2
   35,32
AI 160 DATA 169,123,133,220,169,39,133,22
   1,160,0,177,220,201,42,240,10,217,128,
   5,208,61,200,192,6,208
BD 170 DATA 240,160,0,24,165,220,105,7,13
   3,220,165,221,105,0,133,221,177,220,14
   1,203,31,200,177,220,141
QH 180 DATA 204,31,32,0,0,32,80,35,173,25
   4,175,201,191,208,5,169,27,32,168,32,1
   69,155,141,128,5
HA 190 DATA 32,93,35,76,253,31,96,24,165,
   220,105,9,133,220,165,221,105,0,133,22
   1,160,0,177,220,201
IF 200 DATA 255,208,161,40,169,155,174,23
   4,32,172,235,32,96,32,37,32,32,48,32,3
   2,85,32,48,6,32
NZ 210 DATA 119,32,24,144,245,169,255,141
   ,236,32,169,155,32,168,32,32,119,32,16
   9,12,162,16,157,66,3
VK 220 DATA 32,86,228,96,162,16,169,183,1
   57,68,3,169,32,157,69,3,169,6,157,74,3
   ,169,0,141,232
SZ 230 DATA 32,157,75,3,169,3,157,66,3,32
   ,86,228,140,236,32,96,162,16,169,202,1
   57,68,3,169,32
LM 240 DATA 157,69,3,169,18,157,72,3,169,
   0,157,73,3,169,7,157,66,3,32,86,228,14
   0,236,32,96
WE 250 DATA 160,0,140,235,32,172,235,32,1
   85,202,32,192,17,240,10,200,140,235,32
   ,32,168,32,24,144,236
```

THE COMMANDS

COMMAND	OBJECT	FORMAT
DIR	Disk Directory	DIR
RENAME	Rename File	RENAME D:oldfile,newfile (note the D: in first filename but not in second.)
DELETE	Delete file	DELETE D:filename.ext
LOCK	Lock file	LOCK D:filename.ext
UNLOCK	Unlock file	UNLOCK D:filename.ext
WRDOS	Write DOS.SYS	WRDOS (You must type Y to prompt if want to write DOS.SYS to Drive D1:. N.B. DUP.SYS is not written)
MEMO	Goto Memo Pad	MEMO (400/800 Users will remember the Note Pad obtain by typing BYE. This is similar to that only screen will turn green and you use the ESCAPE Key to EXIT)
HEX	HEX to Decimal Conversion	HEX hhhh (where hhhh is a 4 figure Hexadecimal number between 0000 and FFFF)
DEC	Decimal to HEX Conversion	DEC Decnum (where Decnum is any Decimal number between 0 and 65535)
#FORMAT	Format Disk	#FORMAT (You need to reply Y to the prompt FORMAT (Y/N) for safety. The # was used so as not to get confused with the BASIC FOR statement)
KILL	Delete Routine	KILL (This command allows you to type DOS. If you type DOS without typing KILL first the System will 'appear' to LOCK UP. Pressing system reset will correct this then typing DOS again will take you to DOS. It is still better to type KILL before typing DOS.
HELP	Show list of Commands	HELP
COL	Make Screen colour BLACK	COL (Just a personal preference I prefer the screen black !!)

```
BH 260 DATA 173,232,32,201,0,240,11,169,0
   ,141,232,32,169,155,32,168,32,96,169,1
   ,141,232,32,96,141
GK 270 DATA 233,32,173,7,228,72,173,6,228
   ,72,173,233,32,96,68,58,42,46,42,155,6
   8,58,68,79,83
HU 280 DATA 46,83,89,83,155,68,58,155,0,0
   ,0,0,0,0,0,0,0,0,0,0,0,0,0,0
DD 290 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
   ,0,0,0,169,0,141,198,2,96,173
BM 300 DATA 22,31,133,12,173,23,31,133,13
   ,76,116,228,96,142,16,33,140,17,33,160
   ,0,140,235,32,172
UK 310 DATA 235,32,185,37,31,200,140,235,
   32,201,255,240,6,32,168,32,76,12,33,96
   ,32,37,32,162,16
OW 320 DATA 169,32,157,66,3,169,135,157,6
   8,3,169,5,157,69,3,169,0,157,74,3,157,
   75,3,32,86
QN 330 DATA 228,140,236,32,96,32,37,32,16
   2,16,169,35,157,66,3,169,133,157,68,3,
   169,5,140,236,32
CR 340 DATA 157,69,3,169,0,157,74,3,157,7
   5,3,32,86,228,140,236,32,96,32,37,32,1
   62,16,169,36
GU 350 DATA 157,66,3,169,135,157,68,3,169
   ,5,157,69,3,169,0,157,74,3,157,75,3,32
   ,86,228,140
NB 360 DATA 236,32,96,32,37,32,162,16,169
   ,33,157,66,3,169,135,157,68,3,169,5,15
   7,69,3,169,0
MY 370 DATA 157,74,3,157,75,3,32,86,228,1
   40,236,32,96,70,79,82,77,65,84,32,68,7
   3,83,75,32
NE 380 DATA 40,89,47,78,41,155,255,160,0,
   185,199,32,153,128,5,200,192,3,208,245
   ,162,176,160,33,32
IA 390 DATA 1,33,32,113,31,32,168,32,201,
   89,208,35,32,37,32,162,16,169,254,157,
   66,3,169,128,157
RO 400 DATA 68,3,169,5,157,69,3,169,0,157
   ,74,3,157,75,3,32,86,228,140,236,32,96
   ,160,255,140
YV 410 DATA 236,32,96,79,75,32,84,79,32,8
   7,82,73,84,69,32,68,79,83,46,83,89,83,
   32,40,89
HO 420 DATA 47,78,41,155,255,162,10,160,3
   4,32,1,33,32,113,31,32,168,32,201,89,2
   08,40,32,37,32
GR 430 DATA 162,16,169,189,157,68,3,169,3
   2,157,69,3,169,0,157,75,3,169,8,157,74
   ,3,169,3,157
LU 440 DATA 66,3,32,86,228,140,236,32,32,
   37,32,96,160,255,140,236,32,96,160,255
   ,140,236,32,160,0
RE 450 DATA 185,132,5,32,189,34,153,132,5
   ,200,192,4,208,242,24,173,132,5,10,10,
   10,10,109,133,5
NV 460 DATA 133,213,24,173,134,5,10,10,10
   ,10,109,135,5,133,212,32,170,217,32,23
   0,216,160,0,140,235
ZM 470 DATA 32,172,235,32,185,128,5,200,1
   40,235,32,201,127,176,6,32,168,32,76,1
   58,34,41,127,32,168
AE 480 DATA 32,169,155,32,168,32,96,201,6
   4,144,8,201,71,176,16,56,233,55,96,201
   ,47,144,8,201,58
XQ 490 DATA 176,4,56,233,48,96,162,223,16
   0,34,32,1,33,104,104,96,78,79,84,32,65
   ,32,52,32,70
GL 500 DATA 73,71,32,72,69,88,32,78,85,77
   ,66,69,82,155,255,160,255,140,236,32,1
   69,0,133,242,133
ZQ 510 DATA 212,133,213,169,5,133,244,169
   ,132,133,243,32,0,216,32,210,217,165,2
   13,32,34,35,165,212,32
SX 520 DATA 34,35,169,155,32,168,32,96,24
   ,141,233,32,41,15,141,79,35,173,233,32
   ,41,240,106,106,106
DY 530 DATA 106,24,32,63,35,173,79,35,32,
   63,35,96,201,10,144,6,24,105,55,76,168
   ,32,24,105,48
HC 540 DATA 76,168,32,0,169,32,160,0,153,
   128,5,200,192,127,208,248,96,173,236,3
   2,16,104,201,255,208
SP 550 DATA 1,96,201,128,208,7,162,124,16
   0,38,76,231,35,201,130,208,7,162,149,1
   60,38,76,231,35,201
XB 560 DATA 132,208,7,162,174,160,38,76,2
   31,35,201,136,208,7,162,206,160,38,76,
   231,35,201,170,208,7
CW 570 DATA 162,101,160,39,76,231,35,201,
   138,208,7,162,233,160,38,76,231,35,201
   ,140,208,7,162,6,160
EE 580 DATA 39,76,231,35,201,143,208,7,16
   2,6,160,39,76,231,35,201,162,208,10,16
   2,46,160,39,76,231
TK 590 DATA 35,76,235,35,201,165,208,7,16
   2,63,160,39,76,231,35,201,167,208,7,16
   2,82,160,39,76,231
IW 600 DATA 35,162,115,160,38,32,1,33,96,
   162,102,160,38,32,1,33,96,125,32,32,32
   ,32,32,32,32
MX 610 DATA 32,32,32,80,97,103,101,32,54,
   32,77,69,77,79,32,80,97,100,46,155,255
   ,173,198,2,141
PI 620 DATA 45,36,169,212,141,198,2,162,2
   43,160,35,32,1,33,32,113,31,32,168,32,
   201,27,208,246,169
VJ 630 DATA 0,141,198,2,169,125,32,168,32
   ,32,168,32,160,255,140,236,32,96,162,1
   73,160,36,32,1,33
DS 640 DATA 162,88,160,37,32,1,33,162,8,1
   60,38,32,1,33,173,255,175,201,191,208,
   15,162,77,160,38
GB 650 DATA 32,1,33,32,113,31,169,125,32,
   168,32,169,255,141,236,32,96,125,29,68
   ,73,83,75,32,67
IF 660 DATA 79,77,77,65,78,68,83,155,32,3
   2,32,66,121,32,78,73,67,75,32,72,73,71
   ,71,83,155
BF 670 DATA 32,32,32,102,111,114,32,80,97
   ,103,101,32,54,155,32,32,32,116,121,11
   2,101,32,72,69,76
EA 680 DATA 80,155,255,125,32,32,32,32,32
   ,32,32,32,32,32,32,32,200,197,204,208,
   160,205,197,206,213
VQ 690 DATA 155,68,73,82,32,32,32,32,32,3
   2,32,32,32,32,32,32,32,32,32,32,32,32,
   45,68,73
YK 700 DATA 83,75,32,68,73,82,69,67,84,79
   ,82,89,155,29,82,69,78,65,77,69,32,68,
   58,70,73
NA 710 DATA 76,69,49,44,70,73,76,69,50,32
   ,45,82,69,78,65,77,69,83,32,70,73,76,6
   9,155,29
```

THE BEST ATARI SOFTWARE

Many thanks for all those cards you sent in. The ball is rolling and we hope to bring you the first chart of the very best (and possibly the worst) Atari software as evaluated by the people who really matter, the ones who have paid out good money for the software!

KEEP VOTING!

If you haven't sent in a card, do it now. If you have already have sent in some ratings, keep it going. Every time you buy a few more items of software give them a rating and let us know. Everybody will benefit, including you, by knowing what to look out for and what to avoid.

Rating programs is simple. It does not matter what type of program is involved, just estimate its total quality from 0 (for abysmal) to 10 (for the absolute tops). Stick the name of the program and its rating on a piece of paper and send it to us. Simple isn't it?

Send those cards to
THE BEST ATARI SOFTWARE, PAGE 6, P.O.BOX 54, STAFFORD, ST16 1DR

DISK COMMAND continued

```
VS 720 DATA 87,82,68,79,83,32,32,32,32,32
   ,32,32,32,32,32,32,32,32,32,32,32,45,8
   7,82,73
MA 730 DATA 84,69,32,68,79,83,46,83,89,83
   ,155,29,77,69,77,79,32,32,32,32,32,32,
   32,32,32
VT 740 DATA 32,32,32,32,32,32,32,32,45,71
   ,79,84,79,32,77,69,77,79,32,80,65,68,1
   55,255,29
TS 750 DATA 75,73,76,76,32,32,32,32,32,32
   ,32,32,32,32,32,32,32,32,32,32,32,45,6
   5,76,76
YD 760 DATA 79,87,32,68,79,83,32,65,67,67
   ,69,83,83,155,68,69,76,69,84,69,32,68,
   58,70,73
NO 770 DATA 76,69,32,32,32,32,32,32,32,32
   ,45,69,82,65,83,69,32,70,73,76,69,155,
   29,76,79
YW 780 DATA 67,75,32,68,58,70,73,76,69,32
   ,32,32,32,32,32,32,32,32,32,45,76,79,6
   7,75,83
FF 790 DATA 32,70,73,76,69,155,29,85,78,7
   6,79,67,75,32,68,58,70,73,76,69,32,32,
   32,32,32
NZ 800 DATA 32,32,32,45,85,78,76,79,67,75
   ,83,32,70,73,76,69,155,29,72,69,88,32,
   84,79,32
OI 810 DATA 68,69,67,73,77,65,76,32,32,32
   ,32,32,32,32,45,72,69,88,32,65,70,70,4
   8,155,255
QG 820 DATA 29,68,69,67,73,77,65,76,32,84
   ,79,32,72,69,88,32,32,32,32,32,32,32,4
   5,68,69
IY 830 DATA 67,32,49,50,51,52,53,155,29,3
   5,70,79,82,77,65,84,32,32,32,32,32,32,
   32,32,32
VD 840 DATA 32,32,32,32,32,45,70,79,82,77
   ,65,84,32,68,73,83,75,155,255,32,32,32
   ,32,32,32
MH 850 DATA 32,32,32,32,32,32,200,201,212
   ,160,193,206,217,160,203,197,217,155,2
   55,87,111,114,107,101,100
XR 860 DATA 32,79,107,97,121,155,255,69,8
   2,82,79,82,32,33,155,255,69,82,82,79,8
   2,32,66,114,101
GY 870 DATA 97,107,32,75,101,121,32,80,11
   4,101,115,115,101,100,155,255,69,82,82
   ,79,82,32,80,108,101
IA 880 DATA 97,115,101,32,115,112,101,99,
   105,102,121,32,68,58,155,255,69,82,82,
   79,82,32,67,111,109
YS 890 DATA 109,97,110,100,32,105,110,118
   ,97,108,105,100,32,102,111,114,32,68,1
   05,115,107,155,255,69,82
FF 900 DATA 82,79,82,32,69,110,100,32,111
   ,102,32,70,105,108,101,32,114,101,97,9
   9,104,101,100,155,255
AW 910 DATA 69,82,82,79,82,32,68,101,118,
   105,99,101,32,110,111,116,32,114,101,1
   15,112,111,110,100,105
NA 920 DATA 110,103,155,255,69,82,82,79,8
   2,32,111,110,32,83,101,114,105,97,108,
   32,66,117,115,155,255
JA 930 DATA 69,82,82,79,82,32,111,110,32,
   68,105,115,107,101,116,116,101,155,255
   ,69,82,82,79,82,32
PD 940 DATA 68,105,115,107,32,70,117,108,
   108,155,255,69,82,82,79,82,32,105,110,
   32,70,73,76,69,78
HY 950 DATA 65,77,69,155,255,69,82,82,79,
   82,32,70,105,108,101,32,76,111,99,107,
   101,100,155,255,69
NV 960 DATA 82,82,79,82,32,70,105,108,101
   ,32,78,111,116,32,102,111,117,110,100,
   155,255,68,73,82,42
OX 970 DATA 42,42,155,7,32,67,79,76,42,42
   ,42,155,237,32,75,73,76,76,42,42,155,2
   43,32,82,69
CR 980 DATA 78,65,77,69,155,33,33,76,79,6
   7,75,42,42,155,68,33,85,78,76,79,67,75
   ,155,106,33
BS 990 DATA 68,69,76,69,84,69,155,141,33,
   35,70,79,82,77,65,155,195,33,87,82,68,
   79,83,42,155
SI 1000 DATA 37,34,72,69,88,42,42,42,155,
   100,34,68,69,67,42,42,42,155,247,34,77
   ,69,77,79,42
PJ 1010 DATA 42,155,16,36,72,69,76,80,42,
   42,155,63,36,255,0,255,255,224,2,225,2
   ,0,31
```

STAGE

The PAGE 6 ST section



Mirrorsoft's ART DIRECTOR

Reviews

- *HABAVIEW*
- *K-SPREAD 2*
- *Deep Space*
- *Micro Time Clock Card*

STAR SCROLLER
Fancy some stars in your programs?

NEWS

Ariolasoft recently released the ST version of **SKYFOX**, a well respected and successful 8-bit program from Electronic Arts but shortly afterwards lost the licence for Electronic Arts products. **Electronic Arts** have set up their own U.K. offices. Good news? Maybe not as the company are quoted as saying that the ST will be the least supported of their range. They intend to concentrate on Commodore and IBM.

The **Desktop Publishing** fervour continues with rumours rife that Atari's own system will be available very soon. What will the software be? Publishing Partner? Fleet Street Editor? Apparently not. An Atari source stated that Atari's software will be 'a totally new product'. There are also two more U.K. produced desktop publishing packages in the offing as well as another from the States. Maybe Apple had better watch out!

The **Mega ST series** was launched just a few days ago at the Atari User Show in London. 1, 2 and 4 megabyte models are available and are said to be 100% compatible with existing ST's. The Mega series is housed in a new package comprising of a unit containing the CPU and a floppy drive measuring 22" by 22" and only 2" high. The keyboard is separate and detachable. The system is designed to allow full access to the 68000 bus enabling expansions to be added and with the potential of up to 16 megabytes of RAM. A battery backed clock is included as standard. The blitter chip will not be included at first but there will be an empty socket ready and waiting. Prices were not available at the time of writing and were due to be announced at the show.

Microdeal continue at breakneck pace with an agreement with Quickview Systems to distribute **Zoomracks** and **Zoomracks II** in this country. Also available will be starter packs of ready made templates for home and business use. If you are interested in sound digitising, Microdeal can supply you with **DIGIDRUM** and **REPLAY** produced under licence from 2 Bit Systems. REPLAY can sample your voice, the TV, musical instruments and more and allows samples to be included in programs written in machine code, Fast Basic, Atari Basic or GFA Basic. Other releases due include **Tanglewood**, in which you control five(!) different characters in a 'real-time' adventure, and **Airball** which is a sort of 'mystical arcade game' in which you have to find a wizard's spellbook.

PSS have announced the first U.K. produced wargame for the ST. **Annals of Rome** is to be converted from 8-bit machines where it, apparently, was well respected. Price is £24.95 and the game is 'the first of the PSS range'.

Precision Software launched a new database at the Hanover Fair called **Superbase Personal**. It uses the GEM environment and has no limit on the number of fields or on the size of the records. As many files as are needed can be opened up to build a relational report. Price is £99.95. If it is anywhere near as good as Superscript on the Atari 8-bit it must be a winner. Incidentally, Precision have no plans at present to convert Superscript to the ST. A pity because they could have been the first to produce an ST word processor to rival those on the ATARI 8-bit!

Precision Software have also taken over distribution of the **Abacus** range of books and software from the U.S.A. and Germany. Software includes **Chart Pak** enabling business graphics to be produced direct or from other software, **Paint Pro** with enhancements and **PC Board Designer**. The whole range of Abacus books will also be available including several new titles. ●

GLENTOP

GFA BASIC

INTERPRETER for the ATARI ST

- A high speed BASIC
- GFA BASIC Interpreter programs run on any ST using supplied Run-only Interpreter
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A full high-quality disc-based BASIC Interpreter for the Atari 520 and 1040 ST. Comes complete with:
- GFA BASIC Interpeter disc
- 300 page ring-bound manual
- Utilities and demonstration programs on disc include:
  - ST to GFA BASIC converter
  - Run-only interpreter
  - screen-dump routine

GFA BASIC'S STRUCTURE

- No line numbers required but lines may have labels which can be numeric
- Supports PROCEDURES with local variables
- Recursive Procedures with parameter passing
- IF-THEN -ELSE -ENDIF, WHILE-WEND, DO-LOOP and REPEAT-UNTIL structures fully supported

Graphic Commands

Full access to LINE, CIRCLE, ARC, ELLIPSE, POLYGON, etc. Drawing control of line stye and fill. DEFFIL command for 'unfilling' pattern.

Sound Commands

Control over voice, volume, note, octave and duration. The overall waveform and the mixing of the three voices, or white noise, can be defined.

GEM facilities

- Control of screen height, width
- Control of window size, shape, position
- Mouse control, read position, click states
- Open and Close windows, add titles

Operating System Functions

Routines may be called in BIOS, XBIOS and GEMDOS, with full passing of parameters.

The GFA BASIC Interpreter offers the Atari 520 ST and 1040 ST user a remarkably easy and versatile means of controlling this powerful computer. The built-in Editor facilitates easy data entry, while the Interpreter creates very fast-running code. By means of the **Run-only Interpreter,** programs can be exchanged freely between ST users. The Run-only Interpreter is simply copied onto a disk, along with your program – it's not protected – to provide independent high-speed code. If you have lots of ST BASIC programs of your own then they're not wasted! Simply run them through the Conventer utility supplied and transfer them into GFA BASIC.

REVIEW

Basically the best

GFA Basic is really fast.

. . . but the speed isn't limited to the mindless number crunching, as the graphics demos spectacularly prove. *GFA Basic* is also compact, taking up 55K of valuable memory – yet it provides a structured programming environment second to none, with a bewildering array of useful commands.

A silence descended on the office and mouths hung open as the demo of the block memory move command drew a pattern in a window, then plastered copies of it all over the screen at the rate of about five per second.

Bench test No.	Speed (seconds) Fast Basic	GFA Basic
1	0·145	0·105
2	0·58	0·395
3	1·305	1·025
4	1·55	1·01
5	1·505	1·085
6	2·575	1·765
7	4·11	2·845
8	2·725	2·945
Average:	1·801	1·397

POPULAR COMPUTING WEEKLY

COMPILER for the ATARI ST

. . . and, if the GFA BASIC Interpreter isn't fast enough, then there's always the **GFA BASIC Compiler** to speed things up even more. The Compiler is fully compatible with GFA Interpreter and compiles 100% of commands with no programming restrictions.

A fast two-pass compiler that produces compact, high-speed transportable 67500 object code.
- fully compatible with the GFA BASIC Interpeter
- compiled programs will run on any ST without GFA BASIC
- requires no linker or additional programs
- allows fully secure programs to be created – .PRG files produced cannot be LOADed or LISTed
- commercial software written in GFA BASIC requires no licence or payment of royalty

Facilities

- Four "break key" options
- Easy handling of any arithmetic overflows
- Error numbers can be expanded to produce full error messages, or left unexpanded producing compact programs
- "Bomb errors" can be intercepted and handled within compiled program
- Automatic code optimisation, eg. A*A replaced by A↑2
- INC, DEC, MUL and DIV commands compile to single machine code instructions

Ideal for

- software developers
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- solving technical problems
- training organisations

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HABAVIEW

An easy to use database?

reviewed by Alan Goldsbro

It's really good when you use something that actually matches up to the manufacturers advertising. Habaview is a database that really is simple to learn and use.

Habaview is a flat (card) type database, or as we now call them Information Management Systems. No fancy dialog boxes with indescript messages but a pleasant and immediately efficient system which will cater for most applications. Being Gem based, most of the features and commands are operated from the menu bar at the top of the screen and are very easy to use. Some of the commands can also be executed by pressing the ALTernate and corresponding letter key at the same time – e.g. to QUIT press ALT-Q.

The database can be seen in two different formats 'list' and 'form'. Generally you define the file in the 'list' format and enter data in the 'form' format. The file is best viewed in the list format. To enter your data in Habaview, you have to create a file by firstly defining your data fields and secondly, saving these fields to disk. Once you have decided on how many fields you require and their subsequent length it's a simple, and I really mean simple, operation to produce a data file.

CREATING FIELDS

To create a datafile, you select NEW from the drop down menu, type in your column name (all the fields are in columnular format) then choose from six different types of pre-set formats – Text (letters, numbers, symbols), Date, Yes/No, Amount (numerical, dollar, commas, decimals), Time and Alpha (letters only). Repeat this procedure for all fields as the program automatically moves onto the next column to the right. Columns are easily sized, just move the mouse pointer to the dividing line between fields and drag right or left to the desired width. Files can be changed before data is entered, although once data is entered fields can be added but modifying them is limited to changing the field name. Fields may be moved or deleted at your discretion without any problems.

All data is entered in the 'form' layout. This screen layout can be altered to suit your individual requirements by dragging the fields across the screen and 'clicking' to fasten down. Type in your data, press RETURN and move onto the next field, continuing with the same procedure until your 'form' is complete. One excellent function of the form fill is Automatic Capitalization, which means that when you enter information into Text or Alpha fields the first letter will automatically be a capital. This feature can be toggled on or off.

As previously stated, the best way to view your data is to use the list format. You can arrange your columns in any way, hide them from view or truncate the records seen on the screen without losing any information from your file. Data can be sorted or selected and viewed in that format. The screen will only display thirteen lines at once but by using the slider bars, the screen will scroll up or down and left to right, thus enabling complete scanning of the file. For ease of viewing, a grid defining your columns can be toggled on or off.

Records can be sorted by any field or combination of fields. Select your chosen field by clicking on and highlighting the Title box. Sort high to low or vice versa. If you need to sort by more than one field, then a progressive sort is called for. This enables you to, say, sort alphabetically as first priority and sort economically as the second priority, e.g. Bradford and £20.00 would come before Bath and £30.00.

There are times when you need to select certain records to meet your requirements. Conditions available are by Example or by Range. In the Example mode further conditions are Include (meet the conditions) or Exclude (fail the condition) and further parameters are Equal, Not Equal, Less Than, Greater Than, Less Than and Equal, Greater Than and Equal, and '*' as a wildcard for characters.

PRINTING

The printing to a hard copy is of the 'What you see is what you get' (Wysiwyg) system commonly associated with Gem based software. To achieve your print-out, you can alter the screen list to suit your requirements and away you go. Just select Print from the menu bar, it couldn't be much simpler. If you choose Amount as a column format, when printed the column will automatically be added up. If required your list can be sent to disk in ASCII format for merging with an ASCII word processor. Habaview can also print mailing labels although in a limited fashion. Five lines of thirty characters is the maximum size of label available. To achieve label print you have to move into the form layout and modify your data layout to fit into five lines by dragging fields to suit your requirements.

Once set up, printing is continuous, using your file as the default. If you wish to print only certain files then you must select your data as described earlier and this data will become the default file. To print a number of labels with the same data however can become rather tedious as you have to click on the print routine for every label.

CONCLUSION

Habaview is an excellent database, suitable for the majority of applications, particularly in the home and is quite useful in a working environment. Unfortunately, there is no provision to merge two Habaview files together but, one way, possibly, to overcome this (according to Haba) is to dump the file to disk, load the file to Habawriter and merge it with another file in Habawriter. You will need to have the same number of fields and conditions to make this work.

As new versions come available registered users will be entitled to update for £20.00 plus VAT per disk. Overall I feel Habaview is an excellent program complete with a very good manual, well presented and packaged. Priced at £79.95 it is in the middle range of database prices but certainly near the top as regards quality!

Habaview was supplied by York Computer Centre, to whom I extend my thanks.

ART DIRECTOR

Les Ellingham tries the latest painting program. Is it the best?

Back in September last year Mirrorsoft invited me down for a preview of Fleet Street Editor and while I was there somebody casually said 'You might be interested in seeing a couple of graphics programs'. What I saw were two of the best programs I had seen on a home micro, Art Director and Film Director, and the former had, to my eye, almost everything you could expect from a dedicated graphics system minus the resolution, a limitation of the hardware rather than the software. Art Director was, sadly, a long time being released and in the intervening period Degas Elite hit the market. I was beginning to have doubts whether Art Director was as good as I had thought.

When the review copy arrived I sat down and worked through the manual, command by command until, about two hours later, I had come to the last page. One or two difficult things to grasp at first, but by the end I had taken in most of what Art Director can do and from there on rarely needed to refer back to the manual. My conclusion was that Art Director is a truly professional package written with the graphic artist in mind but useable by anyone with a smidgeon of artistic ability.

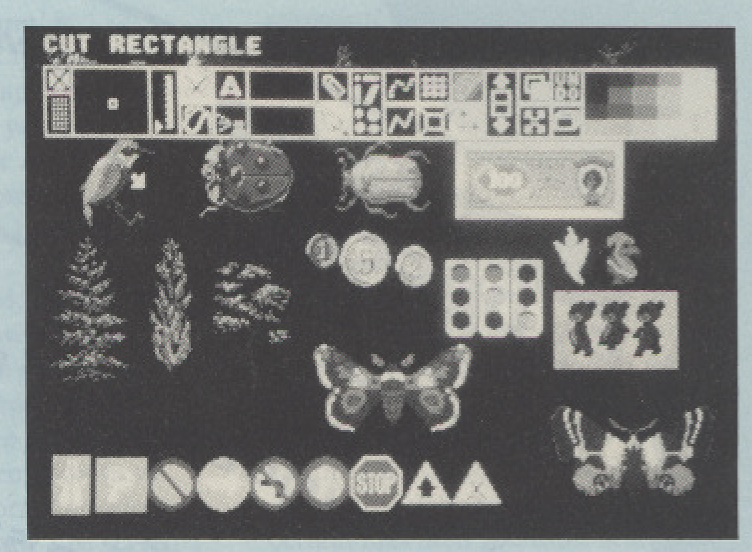
Most readers will be familiar with the basic tools of computer art programs and will have seen either Degas or Neochrome. If we take either of these as a standard I do not have to dwell on the 'ordinary' features found in virtually all drawing programs and can go on to the more advanced features that make Art Director really shine. All the expected 'basic' drawing features are there with the exception, strangely, of being able to draw boxes and circles and the like only in outline and not as solids. These can however be filled to end with the same result.

THE TOOLBOX

Art Director uses a moveable Menu Bar (the Toolbox) for most of its tools with advanced features and utilities as Gem style drop down menus at the top. All of these can be turned off giving the maximum screen for your picture. I prefer the menu bar, which can be turned off and on at the touch of a key to the Degas format of switching from the picture to a separate screen but others may disagree.

In addition to the standard features, the Toolbox menu bar gives you a zoom facility from 3 to 16 times which uses the full screen for the zoom, with the area being worked on shown, in actual size, on the menu bar. There is also airbrush, a small selection of pens, regular text and a few extras to refine drawing style such as smooth and rough draw, grid, co-ordinates and colour selection. A couple more tools, Scroll Screen and Swap Page, begin to give an insight into the power of Art Director.

The program uses two screens for drawing and as well as being able to transfer elements between the two, they can be used either as two separate areas or one continuous screen enabling A4 format pictures to be created. Scroll Screen



operates on either a single screen which can be moved in any direction to 'wrap around', and so position any image at any point on the screen, or on both screens at once. In the latter mode the scrolling is vertical and the two screens become one allowing a virtually continuous image to be created. The effect is of the picture being on a drum which can be rolled around and around.

One small section on the Toolbox shows a pair of scissors and is called Cut Rectangle. A deceptively simple title which forms the basis of what begins to make Art Director really special. Cut Rectangle does just that, cuts a rectangle from a picture from 1 pixel in size to the full screen, but the power comes in automatically storing this rectangle as a brush which can be used for drawing in any of the normal ways as point, freehand or lines and more. The effects are quite astonishing. The brush is transferable between pictures although care must be taken to match the colour palettes of the pictures to be used.

MORE ADVANCED FEATURES

The Cut Rectangle forms the basis of many of the more advanced features which enable the brush to be manipulated in almost any way. So having cut out a rectangular brush what can you do with it? Well first you can flip it horizontally or vertically, turn it left or right or rotate it through any angle you wish. You may halve or double it in size either vertically or horizontally and can continue to do so although you will eventually lose definition. Much more interesting and powerful is the ability to rescale the brush either reducing or enlarging in proportion. Cut a full screen and you can shrink the entire image to a small rectangle and use that as a brush or do it the other way round. Suppose you don't want to keep it in exact proportion? No problem, Art Director has a whole

host of possibilities. Stretch allows you to expand or condense the brush either vertically or horizontally from the original rectangle to any other rectangular shape. Distort goes even further making it possible cut an irregular shape and distort it into any other irregular shape, even to the extent of wrapping the picture around itself! But there's more!

A brush can be 'bent' which allows a flat image to be wrapped into an elliptic or curved shape enabling effects such as wrapping a label around a can! It can also be 'bulged' which gives the effect of painting the image onto a concave or convex surface, and then there is Perspect. This is one of the most powerful commands to my mind. A separate pull down menu allows a perspective grid or 'vanishing point' to be defined on the screen and any brush can then be mapped into this in perspective. If, for example you want to achieve a street scene in true perspective, you need only draw the details as a flat image and then 'flow' this image into the perspective set by your grid! The resulting image, in perspective, is a brush which can be used in any way described above.

WHAT ELSE CAN IT DO?

Enough about brushes (although there is more), what else can Art Director do? Some of the refinements emulate traditional painting methods such as 'smearing' colours into each other, but others are found only in computer art. It is possible to treat the two screens as being placed one on the other and then scrape the 'paint' from one to reveal the image of the other beneath. Some excellent effects can be achieved by combining pictures in this way especially when enhanced by some of the other facilities. To produce smooth transitional effects, pixels can be melted together randomly or shaded so that any chosen colour will be gradually, and randomly, mixed with the next darkest or lightest colour on the palette. Gaps can be patched up between pixels of similar colour allowing a random pattern to be made more solid and many of these features can be combined to automate what is normally a painstaking process in obtaining that 'perfect' picture.

USING COLOUR

Colours can be manipulated in many ways, from the normal setting of colours in the palette to individual control of colours throughout a picture. There are eight palettes available for any picture and some remarkable effects such as 'solarisation' or 'sepia' or even black and white can be achieved by careful selection of colour in different palettes. A single picture can then be viewed in many different forms. Animation is also possible through the colour palettes although, unlike Degas, the colours are cycled through the palettes rather than the sixteen colours of one palette. The cycle pattern can be timed so that one palette stays on screen longer than another.

On an individual picture all the pixels of one colour can be changed to another colour or, by using the blank second screen, each colour of the original picture can be overlaid and built up for additional effects. There are even more sophistications built in, such as the ability to outline an image – try this on text for some great effects – or 'round off' an image either on full screen or in a selectable window. The results are remarkable and would take hours done by conventional means.

And so on to text. Text can be placed on screen at any position and in any font style. Although only one font can be in memory at one time, Art Director is infinitely versatile in this respect as it treats all text as a brush, with all the resulting manipulation possibilities, so that a font can be loaded, text typed from the keyboard and positioned, and then another font loaded and so on limited only by the desired effect required and the number of fonts you have designed. Designing fonts, by the way is done in the same way as drawing any other image and the whole of the facilities of Art Director are available, unlike in other programs which only allow you to plot and unplot pixels. The fonts are designed by using 'masks' loaded from disk and are then saved as full screen images to be used with the appropriate text size.

PRINTING IT OUT

And so finally (almost) onto printing and viewing your finished picture. Art Director, unfortunately supports only Epson or Atari printers and if you are using an Epson you must install it first from the Install Printer accessory (it does not tell you this in the manual) but you can then print your picture in more versatile ways than with other programs. Remember those two screens that can be used as one? Well you can print out the two screens as one continuous A4 image (Print Double) or print each screen separately. You can even print just part of a screen, although this can only be a rectangle defined from the upper left corner. Prior to printing double you can view the entire two screen image on one screen to check the effect, and, just to prove that the authors have thought of almost everything, you can view any picture in mono first to see whether any colours need changing for better effect!

There is more, but a review must end somewhere! There is a slide show program, several fonts and a few demo pictures on the disk as well as a Degas or Neo to Art Director convertor. Hopefully a few public domain programs will appear allowing Art Director pictures to be 'standardised' as has happened with Degas and Neo.

TRULY PROFESSIONAL

I must say that Andromeda and Mirrorsoft have created one of the most superb graphics utilities on any non-dedicated (and therefore affordable) micro. Art Director is a package with truly professional capabilities at a price that any ST owner can afford. Graphic artists can use the program for visuals or such things as package design or just for plain art, whilst home artists can play and design for hours on end. Criticisms levelled elsewhere by graphic artists used to dedicated systems are unfair because they ignore 'affordability' and Art Director really is 'state-of-the-art' as far as the ST and other 16 bit home micros are concerned. To my mind it beats Degas Elite hands down (assuming you don't need medium or high resolution) but you might not agree if you have already forked out for Degas Elite! Even if it were the same price it would be a bargain but it is £20 cheaper at just £49.95 and, if you check the back of the manual you will find some special offers, such as £30 off digitisers and touch tablets, to enhance your art even more!

What more can I say? Check the comparison chart to see whether Degas Elite or Art Director is for you.

ART DIRECTOR or DEGAS ELITE?

See comparison overleaf

ART DIRECTOR/DEGAS ELITE
A comparison of features

Both programs have so many common features called by different names that it is difficult to give the normal 'Yes-No' direct comparison. This summary is intended to outline the most obvious, and important, differences and similarities. It should be noted that some (by no means all) of the features found in one program and not the other can be simulated in the program lacking those features.

DEGAS ELITE FEATURES NOT IN ART DIRECTOR

Medium Resolution in 4 colours
High Resolution in 2 colours
Solid shapes (although can be cut as brushes in Art Director)
Skewing of brush
Mirror drawing
Set colour palette from picture
Select colours direct from all possible
Shade palette from one colour to another
Shadow drawing
Remove block
Save brush to disk
User defined lines

ART DIRECTOR FEATURES NOT IN DEGAS ELITE

Fill with defined brush/pen
Fonts automatically as brushes
Smooth/Rough draw
Window to define area of screen to work on
View colour picture in mono
Cursor co-ordinates
Scroll two screens
Scroll one screen
Rescale brush
Bend brush to ellipse/curve
Bulge brush to concave/convex
Perspective brush
Cut oval brush
Flip brush horizontally or vertically
Halve/Double brush size
Scrape to reveal second picture
Melt
Shade light/dark
Patch
Fill contour
Colour mask
Round off
Define and Use Sprite
View double
Define print size
Print double screens

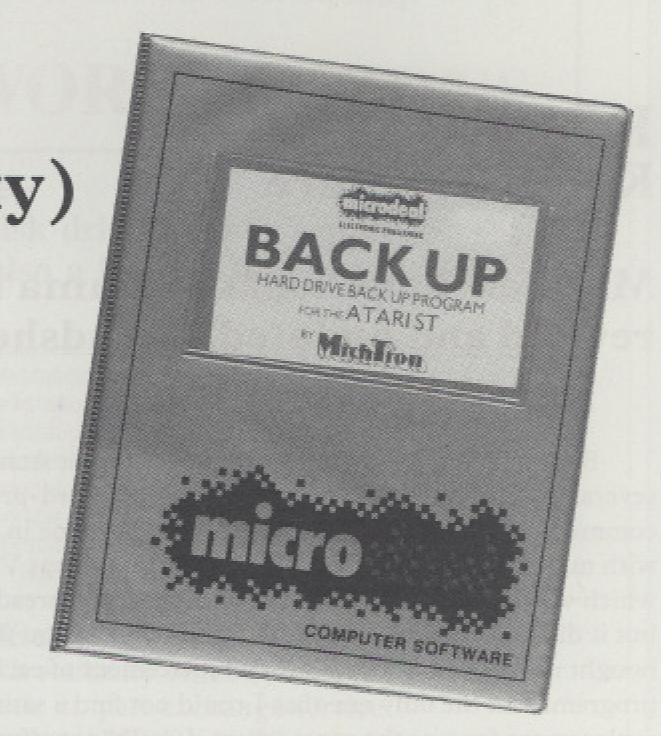
FEATURES COMMON TO BOTH PROGRAMS

16 colours in low resolution. Zoom. Rectangular definable brush. Solid fill. Pattern fill. Definable patterns. Airbrush. Airbrush with defined brush. Definable fonts. Selectable drawing speed. Selectable drawing size. Erase. Grid/Snap. Palette colour control. Straight lines. Zigzag lines. Rays. Lines with user definable brush. Stretch brush. Distort brush. Rotate brush. Transparent or block brush. Assimilate brush. Smear. Change all pixels of one colour. Undo. Cut block to another picture.

FEATURES EXECUTED IN DIFFERENT WAYS

	Art Director	Degas Elite
Zoom	Up to 16 times at full screen	Up to 12 times at one third screen
Fonts	One in memory at one time	Up to 10 in memory depending on screens in use
Size	4 sizes affecting Airbrush, Melt, Round off, Smear, Shade, Scrape and Patch	3 affecting airbrush
Speed	4 affecting the same features as size	7 affecting draw and airbrush
Pens	8 selectable from menu	15 selectable from menu
Colour cycling	Through 8 palettes	Through sixteen colours of one palette
No. of screens	2	Up to 8 on 1040ST, up to 4 on 520ST
Outline shapes	Square, Rectangle, Circle, Oval, Polygon	Circle, Square, Polygon
Turn brush	Left or right instantly	Use Rotate
Defining Fonts	As pictures using masks	With separate Font Editor.
Copy Page	With command	By using full screen as block
Printer support	Epson and Atari only	Dozens!
Outline	1 option	3 options

Microdeal BACKUP (Hard Disk backup utility)



reviewed by Matthew Jones

As explained in my review of the Atari SH204 hard disk (Issue 26), the process of backing up any hard disk onto floppies can be very slow and laborious. A backup program is used to simplify the process by organising the copying of each file and folder onto disks, and asking for another when the current disk becomes full.

BACKUP'S DESKTOP

Backup is a GEM based program, and when loaded it displays a set of icons on the left of its desktop. These icons consist of one for each disk drive on the system (it is possible to backup floppies too), and a single 'Path' icon which enables backups of an individual folder (and its sub-folders). The menus available are File, Options and Help (the help is of limited use).

File gives you the main control options, which include 'Full backup' (copy every file on the specified drive / path), 'Incremental backup' (using the flag set by TOS, as explained in the SH204 review), and 'Backup by date' which allows you to backup any files created after a given date. To use these, you select an icon (and give the path if appropriate), and then select the menu item. The backup then proceeds as dictated by the options set.

OPTIONS

Options enables you to choose whether to format, zero (a fast version of format) or leave the destination disk alone, skip or copy system and hidden files, verify writes, set the number of buffers, not segment files and update the 'history'. Write verification is extra to the normal verify of the floppy, and if the data is valuable (what isn't?) then this is useful extra security. Non-segmentation of files is used to stop Backup splitting a file in two if it does not fit in the space left on the current backup disk. If you want to be able to use the files directly off the floppy, then this is useful (see later). The history is a record kept on the hard disk of each file that has been copied onto floppies, and may be useful as an audit trail.

While backing up, a 'format' dialog is displayed, which allows you to choose which drive to backup files onto (A: or B:), and whether to format, zero or use as-is (useful to have the choice again for each new floppy), and the drive/floppy type. Available types are Single/Double sided, 80/40 track and 9 or 10 sectors per track, which allows you a great deal of flexibility, and to get the maximum on the disk. The 40 track option is useful if you have a 40 track 5½ inch IBM type drive (on which disks are cheaper), but the disks formatted cannot then be used on an IBM PC.

Restoration is done by selecting the icon and then selecting 'Restore' in the file menu. Paths are supposed to work too, but my version does not. This is disappointing as it would also be nice to restore only a directory from a previous complete backup. You can select a 'Don't overwrite files' option which stops an existing file being overwritten by a restore, but this just stopped the whole restore when I tried it. Due to these problems, I always backup in 'don't segment' mode, which means I can do partial restores using the normal GEM Desktop copying ability. Full drive restores do work properly however.

Image backups and restores are available, which mean that the Backup program will take copies of each individual sector on the hard disk, regardless of what it may contain (file or otherwise), and copy it to floppy. Restoration just copies it straight back, overwriting anything that was there before. The floppies created are useless to GEM Desktop, and the process is one you should only use if you want to mirror the hard disk absolutely at a later date. Image restores will overwrite everything new and old, so use with caution.

PROBLEMS...

As you might have guessed, Backup is not without fault. In fact, the faults are too numerous to list them all, but they range from small and insignificant (the pointer at the format dialog is a busy bee not an arrow), through bad program logic (after giving a path, clicking on a new drive still uses it), to the disastrous (it sometimes hangs for no apparent reason in the middle of a backup – bad news 17 disks into the backup). When it hangs, you have to reboot, which also loses your history file update. Backup is also unable to backup the folder from which it is being run!

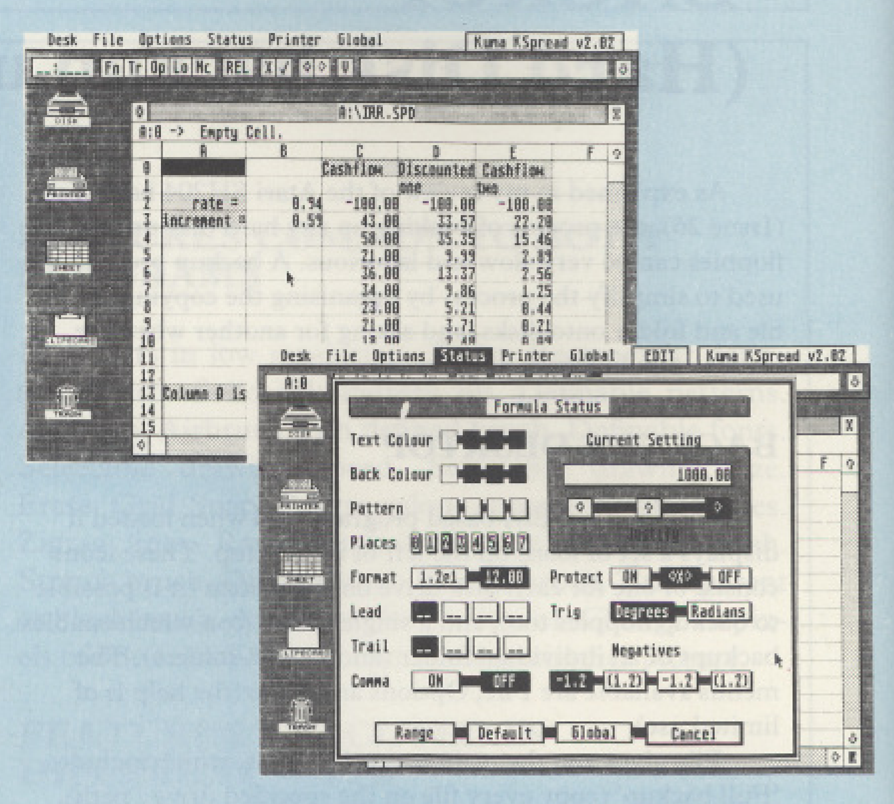
So much for problems, which can be sorted out in updates (I hope), but what I would also like to see in future versions is the ability to see, before a backup, a list of what is likely to be backed up, and having an option to stop a file. This is because I find it very wasteful to have .BAK files and others on the floppies, just because I forgot to delete them first (or didn't find them). Also, as mentioned above, the ability to restore partial directories or files from a larger backup should be provided.

CONCLUSION

Despite the problems, some major, I would not be without this program (at the moment there is no competitor). Microdeal must release a new version (and at low cost to existing owners), but for the moment this is a great improvement on previous backup methods. •

KSPREAD 2
Kuma Software

Matthew Jones looks at Kuma's revised and updated spreadsheet.



Before the ST came out, I used my eight bit Atari 800 for several purposes. As well as programming, I word-processed, communicated, and used a spreadsheet to keep me in touch with my bank account. The spreadsheet I used was Visicalc, which was pretty basic compared with modern spreadsheets, but it did all I required, and it did it fast and easily. When I bought my ST I was looking for a replacement of each of these programs and the only one that I could not find a satisfactory replacement for was the spreadsheet. I could not afford the full featured VIP, and so looked at K-Spread. At the time Kuma was, to be fair, still getting used to the Atari ST and GEM and it is not until you get feedback that you can judge how usable your program is. I rejected K-Spread on one count, and that was the terrible input method which to my mind made it so slow as to be unusable. I have still not found the right spreadsheet, so the chance to review the latest revised version was welcomed.

THE PROGRAM

K-spread 2 comes on an unprotected disk in the usual Kuma packaging and with a 66 page 'spiral' bound manual. On running the program, a single spreadsheet window is displayed with a set of icons representing a disk drive, printer, spreadsheet, clipboard and trash can shown on the left of the desktop. There is a standard GEM menu bar with a spreadsheet function/edit bar just underneath.

You can start to use the spreadsheet straight away, but to get further than very basic use, you must begin to understand some of the many options available. For instance, when you have finished entering a cell, you can press Return to go to the next cell. It is possible to set the direction of entering cells by clicking on a little box to the right of the edit box, or by hitting the appropriate cursor key. From then on, Return will take you in that direction. It is also possible to define a block that you are going to fill with data, in which case you go left to right until you get to the rightmost cell, at which point you go to the leftmost cell on the next line, and so on. I am pleased to see such features, but still it does not come quite as easy as my old Visicalc.

If I typed '56' and 'Total' into Visicalc, it worked out that 56 was a number, and 'Total' was text. With K-Spread 2 you have to tell it which is which. I understand that K-Spread 2 has an extra data type (column titles) but even so I think that this is an un-necessary hassle, and it gets in the way of setting up a spreadsheet. In fact K-Spread 2 has two more data types, for separate 'value' and 'formula' cells. Maybe I mis-understand these, but surely a value is just a formula with no operators? Anyway, you must select which type the cell contents are by either the TAB key, or clicking on a box. As a new user I found this very annoying as I did not know the sequence and kept clicking past the type I wanted, having to go round again.

Apart from this problem, which I think will ease with time, I am impressed with K-Spread 2. There are plenty of functions available, including conditionals (IF THEN ELSE), logicals (AND OR NOT), trigonometric functions, time and date functions (TIME, DATE, DAY, MONTH), and general functions (ABS, INT, SQRT). One facility I think is essential in a spreadsheet, and which is included, is the ability to move around the sheet in the middle of formula entry in order to identify a cell to be included. This saves you having to remember, for example, that the subtotal of spare parts is at cell G53, you move around with the scrollers instead, find the cell you want, click on it to put the reference into the formula, and then continue with the rest. K-Spread also has labels to help in this.

Other facilities include prompted inputs and macros. A prompted input will make K-Spread 2 ask the operator for a new value each time the sheet is recalculated. This is useful for creating spreadsheets for others to use. Also related to this is the HIDE facility, which stops people viewing or altering the cell contents unless they know the password (though if you are looking for a secure spreadsheet, check that you cannot still send the data out to a DIF file – see later). Macros are user-defined functions, and can be passed parameters which may include the current cell position.

A clipboard for cut and pasting ranges of cells is available, and more than one window can be open onto the sheet but multiple sheets cannot be handled. As well as the K-Spread 2 '.SPD' file format, it is possible to import and export data in DIF (Data Interchange Format) files.

A major part of spreadsheets is printing. K-Spread 2 has a full range of options including horizontal and vertical divider characters, column/row headers (A B C etc), page break on/off, width, depth, margins, output port (parallel or serial) and paper change pause on/off. K-Spread 2 is smart enough to split the printout in two if your printer is not wide enough to print the area selected. If you have a true Epson FX80 compatible, with downloadable font capability, you can select sideways printing, which can print up to 66 lines by 'unlimited' columns.

STAR -SCROLLER

by Paul Lay

Regular readers may recall that I wrote a star scrolling routine for the 8-bit models that was published in issue 18. Intrigued by the possibilities of doing the same on the ST I set about writing a similar program and ST Star Scroller is the result.

The program itself is really just a bit of fun but I hope that it will give programmers an insight into using the VBI on the ST. ST Star Scroller scrolls 2 planes of stars in any resolution from right to left across the screen in a VBI interrupt. When the program is run it attempts to insert the routine into the VBL queue and, having done so, it will return to the desktop with the stars scrolling. You can now run any other program and, as long as it does not alter the VBL interrupt or move screen memory somewhere else, those stars will keep on scrolling! By running the program again you'll end up with another set of stars and you can keep going until so much work is being done in the VBL that the machine locks up!

The Assembler source code is quite useful as its shows the correct way to set up VBL routines (at least for use with the operating system). It also shows that the GEMDOS routines for terminating a program without reclaiming the memory occupied are of some use, even without multi-programming capabilities.

```
10    rem ************************************************
20    rem *                                              *
30    rem *                ST Star Scroller              *
40    rem *                  By Paul Lay                 *
50    rem *                                              *
60    rem ************************************************
70    fullw 2: clearw 2: gotoxy 0,0
80    ? " ST Star Scroller": ? " By Paul Lay": ?
90    ? " Insert destination disk, hit any key";
100   key$=input$(1): ?: ?: ? " *** Creating file 'a:stars.prg'"
110   on error goto 210
120   open "R", #1, "a:stars.prg", 1
130   field #1, 1 as byte$
140   on error goto 220
150   checksum%=0: for rec%=1 to 831
160   read code%: checksum%=checksum%+code%
170   lset byte$=chr$(code%): put #1,rec%
180   next rec%: close #1
190   if checksum%<>23763 then 220
200   ? " *** Creation successful": end
210   ? " *** Error opening file": end
220   ? " *** Error in data statements": end
230   data 96 , 26 , 0 , 0 , 3 , 8 , 0 , 0
240   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
250   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
260   data 0 , 0 , 0 , 0 , 63 , 60 , 0 , 2
270   data 78 , 78 , 84 , 143 , 35 , 192 , 0 , 0
280   data 1 , 110 , 63 , 60 , 0 , 4 , 78 , 78
290   data 84 , 143 , 227 , 128 , 65 , 249 , 0 , 0
300   data 1 , 92 , 51 , 240 , 8 , 0 , 0 , 0
310   data 1 , 114 , 65 , 249 , 0 , 0 , 1 , 98
320   data 51 , 240 , 8 , 0 , 0 , 0 , 1 , 116
330   data 65 , 249 , 0 , 0 , 1 , 104 , 51 , 240
340   data 8 , 0 , 0 , 0 , 1 , 118 , 75 , 249
350   data 0 , 0 , 1 , 120 , 62 , 60 , 0 , 200
360   data 63 , 60 , 0 , 17 , 78 , 78 , 84 , 143
370   data 192 , 121 , 0 , 0 , 1 , 114 , 176 , 121
380   data 0 , 0 , 1 , 116 , 100 , 234 , 58 , 192
390   data 81 , 207 , 255 , 230 , 97 , 0 , 0 , 78
400   data 66 , 167 , 63 , 60 , 0 , 32 , 78 , 65
410   data 92 , 143 , 47 , 0 , 32 , 120 , 4 , 86
420   data 48 , 60 , 0 , 8 , 74 , 152 , 103 , 0
430   data 0 , 10 , 81 , 200 , 255 , 248 , 96 , 0
440   data 0 , 8 , 33 , 60 , 0 , 0 , 0 , 172
450   data 63 , 60 , 0 , 32 , 78 , 65 , 92 , 143
460   data 63 , 60 , 0 , 0 , 47 , 60 , 0 , 0
470   data 8 , 0 , 63 , 60 , 0 , 49 , 78 , 65
480   data 97 , 0 , 0 , 10 , 97 , 0 , 0 , 64
490   data 96 , 0 , 0 , 2 , 32 , 121 , 0 , 0
500   data 1 , 110 , 42 , 124 , 0 , 0 , 1 , 120
510   data 48 , 60 , 0 , 100 , 50 , 57 , 0 , 0
520   data 1 , 88 , 52 , 57 , 0 , 0 , 1 , 90
530   data 50 , 93 , 179 , 112 , 144 , 0 , 209 , 252
540   data 0 , 0 , 0 , 160 , 50 , 93 , 181 , 112
550   data 144 , 0 , 209 , 252 , 0 , 0 , 0 , 160
560   data 81 , 200 , 255 , 230 , 78 , 117 , 48 , 57
570   data 0 , 0 , 1 , 88 , 12 , 64 , 128 , 0
580   data 102 , 0 , 0 , 6 , 97 , 0 , 0 , 38
590   data 227 , 88 , 51 , 192 , 0 , 0 , 1 , 88
600   data 48 , 57 , 0 , 0 , 1 , 90 , 12 , 64
610   data 64 , 0 , 102 , 0 , 0 , 6 , 97 , 0
620   data 0 , 22 , 229 , 88 , 51 , 192 , 0 , 0
630   data 1 , 90 , 78 , 117 , 42 , 124 , 0 , 0
640   data 1 , 120 , 96 , 0 , 0 , 8 , 42 , 124
650   data 0 , 0 , 1 , 122 , 50 , 60 , 0 , 100
660   data 52 , 21 , 102 , 0 , 0 , 8 , 52 , 57
670   data 0 , 0 , 1 , 116 , 148 , 121 , 0 , 0
680   data 1 , 118 , 58 , 130 , 88 , 141 , 81 , 201
690   data 255 , 232 , 78 , 117 , 0 , 1 , 0 , 1
700   data 0 , 248 , 0 , 252 , 0 , 126 , 0 , 160
710   data 0 , 160 , 0 , 80 , 0 , 8 , 0 , 4
720   data 0 , 2 , 0 , 0 , 0 , 0 , 0 , 0
730   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
740   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
750   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
760   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
770   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
780   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
790   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
800   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
810   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
820   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
830   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
840   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
850   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
860   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
870   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
880   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
890   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
900   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
910   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
920   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
930   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
940   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
950   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
960   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
970   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
980   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
990   data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1000  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1010  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1020  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1030  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1040  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1050  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1060  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1070  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1080  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1090  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1100  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1110  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1120  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1130  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1140  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1150  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1160  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1170  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1180  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1190  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1200  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1210  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1220  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0
1230  data 0 , 0 , 0 , 0 , 0 , 0 , 0 , 10
1240  data 16 , 8 , 6 , 8 , 6 , 8 , 6 , 18
1250  data 6 , 52 , 42 , 6 , 10 , 6 , 36 , 20
1260  data 6 , 20 , 8 , 10 , 16 , 6 , 0
```

```
;                       ***************************
;                       *     ST Star Scroller     *
;                       * ------------------------ *
;                       * by Paul Lay, August 1986 *
;                       ***************************

; ***************************************************************************
; Equates.

gemdos          equ     $01                     ; gemdos trap vector
super           equ     $20                     ;       supervisor entry
keep_process    equ     $31                     ;       exit maintaining store

xbios           equ     $0E                     ; xbios trap vector
physbase        equ     $02                     ;       return screen RAM address
getrez          equ     $04                     ;       return screen resolution
random          equ     $11                     ;       return random number

vblqueue        equ     $0456                   ; VBI queue

; ***************************************************************************
; Initialise the stars and set up the VBI.

start
                move.w  #physbase,-(sp)         ; find screen memory
                trap    #xbios
                addq.l  #$02,sp
                move.l  D0,scrn_mem_pointer     ; save pointer

                move.w  #getrez,-(sp)           ; find screen resolution
                trap    #xbios
                addq.l  #$02,sp
                asl.l   #$01,D0
                lea     masks,A0                ; save initial position mask
                move.w  $00(A0,D0.l),bit_mask
                lea     sizes,A0                ; save scan line size (words)
                move.w  $00(A0,D0.l),line_size
                lea     alongs,A0               ; save course scroll step
                move.w  $00(A0,D0.l),bytes_along

                lea     star_x,A5               ; initial star positions
                move.w  #$C8,D7
get_position
                move.w  #random,-(sp)           ; get random position
                trap    #xbios
                addq.l  #$02,sp
                and.w   bit_mask,D0             ; mask appropriately
                cmp.w   line_size,D0            ; and check range
                bcc     get_position
                move.w  D0,(A5)+                ; set position
                dbra    D7,get_position

                bsr     draw_stars              ; draw the stars

                clr.l   -(sp)                   ; enter supervisor mode
                move.w  #super,-(sp)
                trap    #gemdos
                addq.l  #$06,sp
                move.l  D0,-(sp)

init_vbi
                move.l  vblqueue,A0             ; search VBI queue
                move.w  #$08,D0
test
                tst.l   (A0)+
                beq     set_vbi                 ; check for free entry
                dbra    D0,test
                bra     exit_supervisor
set_vbi
                move.l  #my_vbi,-(A0)           ; vector VBI routine

exit_supervisor
                move.w  #super,-(sp)            ; return to user mode
                trap    #gemdos
                addq.l  #$06,sp

                move.w  #$00,-(sp)              ; terminate program
                move.l  #$800,-(sp)             ; of size $800 bytes
                move.w  #keep_process,-(sp)     ; exit program maintaining store
                trap    #gemdos

; ***************************************************************************
; The star scrolling VBI.

my_vbi
                bsr     erase_stars             ; remove stars
                bsr     move_stars              ; update positions
                bra     draw_stars              ; redraw stars

; ***************************************************************************
; Draw and erase the stars (exclusive_or).

draw_stars
erase_stars
                move.l  scrn_mem_pointer,A0     ; locate screen memory
                move.l  #star_x,A5              ; locate star positions
                move.w  #$64,D0
                move.w  even_bits,D1            ; bit image for even stars
                move.w  odd_bits,D2             ; bit image for odd stars
draw_next
                move.w  (A5)+,A1                ; locate star offset
                eor.w   D1,$00(A0,A1.w)         ; store even bit image
                add.l   #$A0,A0
                move.w  (A5)+,A1                ; locate star offset
                eor.w   D2,$00(A0,A1.w)         ; store odd bit image
                add.l   #$A0,A0
                dbra    D0,draw_next
                rts

; ***************************************************************************
; Move the stars.

move_stars
                move.w  even_bits,D0            ; test even bit image
                cmpi.w  #%1000000000000000,D0
                bne     okay1
                bsr     course_even_scroll      ; course scroll even stars
okay1
                rol.w   #$01,D0                 ; fine scroll even bit image
                move.w  D0,even_bits

                move.w  odd_bits,D0             ; test odd bit image
                cmpi.w  #%0100000000000000,D0
                bne     okay2
                bsr     course_odd_scroll       ; course scroll odd stars
okay2
                rol.w   #$02,D0                 ; fine scroll odd bit image
                move.w  D0,odd_bits
                rts

; ***************************************************************************
; Course scroll the even stars (slow plane).

course_even_scroll
                move.l  #star_x,A5              ; set address of first even star
                bra     all_scroll              ; perform the scroll

; ***************************************************************************
; Course scroll the odd stars (fast plane).

course_odd_scroll
                move.l  #star_x+$02,A5          ; set address of first odd star

; ***************************************************************************
; Perform the scroll.

all_scroll
                move.w  #$64,D1
next_scroll
                move.w  (A5),D2                 ; get star offset
                bne     okay3                   ; check if zero
                move.w  line_size,D2            ; reset position
okay3
                sub.w   bytes_along,D2          ; move left (course)
                move.w  D2,(A5)                 ; store new offset
                addq.l  #$04,A5                 ; move onto next star
                dbra    D1,next_scroll
                rts

; ***************************************************************************
; Variables.

even_bits                                       ; even bit image
                dc.w    %0000000000000001
odd_bits                                        ; odd bit image
                dc.w    %0000000000000001
masks                                           ; masks for initial positions
                dc.w    $F8,$FC,$7E
sizes                                           ; sizes of scan lines (words)
                dc.w    $A0,$A0,$50
alongs                                          ; course scroll steps
                dc.w    $08,$04,$02
scrn_mem_pointer                                ; pointer to screen memory
                ds.l    $01
bit_mask                                        ; bit mask used
                ds.w    $01
line_size                                       ; line size used
                ds.w    $01
bytes_along                                     ; course scroll step used
                ds.w    $01
star_x                                          ; star positiions
                ds.w    $C8

; ***************************************************************************

                end
```

Star scroller source code

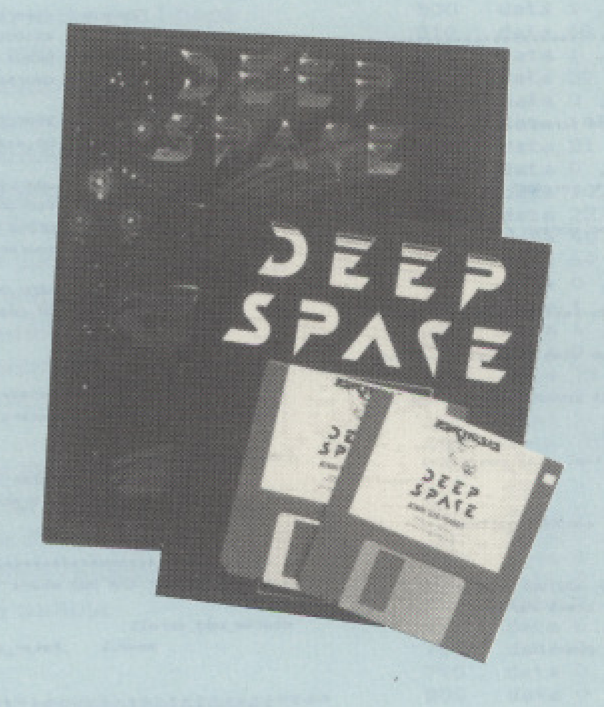
HOW DIVERSE THE ST?

An arcade game, a printing utility, an emulator, a clock, a spreadsheet and a programming tool. Take your pick!

DEEP SPACE

Psygnosis
£39.95

Reviewed by John Davison jnr



This game is possibly Psygnosis' best yet. It is similar in style to 'Elite', but you play the part of a freelance buccaneer type character going by the name of Strix.

The action begins in the Al-Nair system which is the least dangerous of a group of five hostile star systems. Entry to each of the other (more hostile) systems, is gained by passing through a stargate, which can be found somewhere within the system. The basic idea of the game is to travel around and get rich. Money units are known as credits, and enable you to buy energy and repairs when you need them. To gain money you must destroy hostile craft and, if possible, capture the pilots.

The screen shows the view through the cockpit window of your fighter, which is controlled by a combination of mouse and either joystick or keyboard, or both. After a few hours play I decided that the easiest method of control was to use the joystick for movement and to use the mouse for everything else except to activate the engines.

The cockpit is generously equipped with various electronic gadgets and gizmos. At the top of the screen you will find the clock, an energy read out, and an alert system/status display. The main controls are portrayed at the bottom of the screen. On the left hand side is the main computer console with buttons for activating six major functions, such as maps, auto scoops, communications and damage reports.

The communications facility elaborates on what the status display shows and will give you more than one message at a time (sometimes). The auto scoop facility shows you the position of the Strix fighters scoop, which is used for capturing items such as energy or repair drones or even pilots who have ejected from hostile space craft which have been destroyed. Capturing these pilots can become quite profitable as the 'Agency' (the people who pay you) pay a fair bit for picking up one of the little green guys for examination.

The long range map consists of a split screen display. The left hand side shows a view from above your ship, the right hand side shows a view from behind, thus giving you the X, Y and Z co-ordinates of different craft and planets within the system. The navigation computer is set by moving a small cross-hair on the long range map display, and is best described as a series of squares which must be kept in line to stay on course. When playing the game, it is a simple instrument to use and especially useful on later levels.

In the centre at the bottom of the screen you have the main console consisting of two moving parts, a speed lever controlling velocity and the control column for direction. The speed lever can be activated by either the mouse or the keyboard and the control column by either mouse or joystick.

Over on the right hand side is the 'function pod', which lets you activate some of the ships major functions such as shields and retro thrusters. Also from this pod you can change weaponry, look aft and move the viewing window about without disturbing the ships course. Finally, on the far right is the short range scanner which 'pops-up' when activated. It displays the relative positions of any objects immediately around you and can operate at five levels of magnification. This scanner is especially useful for finding drones (the craft which bring repairs and energy etc.), and during combat it is extremely useful as it shows almost exactly where an enemy ship is, in three dimensions.

The graphics in 'Deep Space' are fantastic. The cockpit is shaded in different tones of grey, and the enemy craft are true, solid, 3D images. They are colourful and extremely fast, although a little blocky and the animation is quite jerky, however you don't notice this as the combat action is fast and furious.

You can also fly around the planets, moons and even the star at the centre of the particular system you are in. The overall scale of the game is most impressive. Each of the five systems are filled with planets, moons, meteor fields, meteor storms, mine fields and they all (except the most

MEGAFONT ST
XLENT Software (UK)

Reviewed by Alan Goldsbro

One of the necessities of owning a printer is the ability to dump text and graphics in a range of styles and sizes. Megafont ST will let you print text and program files in a variety of character styles, using either an 8 × 8 standard 8 bit font or 8 × 16 DEGAS compatible font. Any ASCII, 1st Word or Wordstar compatible file along with Basic program listings can be dumped to the printer in a multitude of different fonts. Graphics can be merged into text files by using Megafont ST. If that's not enough, Megafont ST includes both 8 × 8 and 8 × 16 font editors.

[redacted]

dangerous system – Vexon) have two Stargates within them. Your main objective in the game is to gain credits, as mentioned earlier, but your final task (set by the Agency) is to destroy the Vexon mother ship, which can only be destroyed by special weapons known as 'Quark bombs'. I have never got this far, as the game gets very difficult at later stages, and attacks by Vexon fighters become highly lethal!

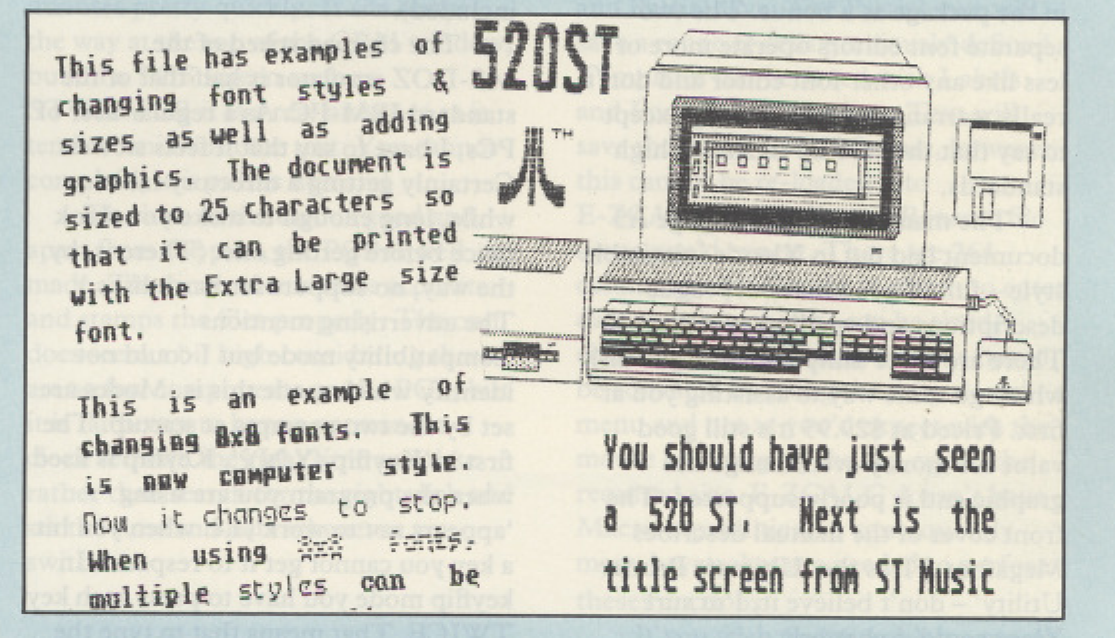
My only complaint about the game concerns the method of control. The pitch of the craft would appear to have been implemented upside down! To move upwards you have to push the stick forwards, not downwards as you would expect. This is quite irritating at first, but you will (eventually) get used to it. Psygnosis really have got to concentrate on control methods. They have not yet brought out a game which is easy to control!!!

The sounds within the game are fairly competent but, as with a lot of ST games, there are not enough, and they are not exactly amazing. The packaging is superb, the game comes on two single sided disks, in a largish cardboard box, with a good, well written manual and, believe it or not, a comic book! This shows what happened leading up to your position at the very beginning of the game.

Deep Space is very good, if a little expensive, and I can really recommend it to anyone who likes a game where you need to use both adventure gaming skills and a pretty good trigger finger.

For those who are unfamiliar with the jargon, a font is the name used in computer parlance for style of text, for example most of this article is printed in written in PLANTIN ROMAN (the normal style) *and this section is written in PLANTIN ITALIC.* Many hundreds of styles are available. An 8 × 8 computer font is made up of a matrix of 8 cells × 8 cells, similar to the layout of a chessboard and an 8 × 16 font is consequently made up of 8 cells × 16 cells. The greater number of cells to a font, generally the better the character formation.

Whenever I review software, I always see how easy it is to operate without using the manual. Megafont ST is GEM based and by using the drop down menus I had very few problems in finding my way round the program. There are a few parts to Megafont ST that require a look at the



instructions but, once read they could probably be put safely away for reference only. The disk also comes unprotected for hard disk and backing up purposes. Well done Xlent for your confidence in the market!

There are six sections to the program, as we run through them you'll be able to build up your own picture of the usefulness of Megafont ST.

The first section is Font Type. Choose from any of the twenty 8 × 8 fonts or from sixteen of the 8 × 16 fonts all available on the program disk. Fonts (either 8 × 8 or 8 × 16) may be lifted from other disks such as DEGAS or alternately they can be constructed using the separate editors.

File Type is the second section. Text files can be printed 'as is' i.e. every character used in the file will be printed except for the carriage return symbol although, in this mode, only one font can be used. In 'ASCII as is' all the characters with ASCII values from 0 to 255 will be printed whereas 'ASCII strip' will only print those characters with values from 0 to 127. In the ASCII modes multiple fonts may be used and 1st Word and Wordstar compatible files are also catered for.

The third section deals with the size of the printing. For Epson printers the number of characters across the page range from 120 (small), 60 (medium), 40 (large) and 29 (extra large). Other printers (NEC, Prowriter, SMM804, Gemini) have slightly different settings.

Moving onto the fourth section takes you into the Page options. Left and right margins can be set along with line spacing from 1 line to 8 lines in between text. Micro spacing and boldfacing are supported for the Epson range. A handy feature in this section is paging, after 55 lines of 8 × 8 text or 35 lines of 8 × 16 text the printer will automatically form feed.

The penultimate section holds the final choices for printing your text file. This section also houses a Keyboard input of up to 75 characters which is handy when all you want is a simple one-liner! Also included in this section is the ability to print all the characters held in the current font selected. Another useful function is to download any font to the printers RAM although this only applies to those printers which have this capability such as the Epson FX series and if your fortunate to have more than one printer then you can change printers without having to leave the program.

Section six covers graphics. DEGAS files, Neo (32128 bytes) and Typesetter, Typesetter Elite and Rubber Stamp files (32000 bytes) are all acceptable for printing. Boldfacing

and inverse are executable and parameters and margins can be set for placing the graphics. The Graphic Delimiter can be altered to suit and this takes the same requirements as the text delimiter. All graphics are printed the same size, approximately 135 mm square, but both Mono Icons and Colour Icons can be printed and their size is approximately 65mm square.

That just about covers the printing section of Megafont ST. The text functions are excellent in their design and operations, however the graphic functions were largely a disappointment to me. Megafont ST has really been designed to print text files with the added ability to include graphics within those files. There seems to be no way to alter the size of the graphics, which to me was what the original 8 Bit Megafont was all about. Perhaps the font editors were included in the package as a bonus. The two separate font editors operate more or less like any other font editor and don't really warrant much reviewing except to say that they are up to Xlents high standards.

The manual is a sixteen page A5 document laid out in Xlent's inimitable style – full of good humour, vague descriptions and spelling mistakes! There are three sample files on the disk which go some way to assisting you at first. Priced at $29.95 it's still good value for money even though the graphic end is poorly supported. The front cover of the manual describes Megafont ST as the 'Ultimate Printer Utility' – don't believe it, I'm sure Xlent could do better!!

MS-DOZ Emulator
Robtek

Reviewed by Matthew Jones.

As a programmer who works on both Atari and IBM PCs, I was most interested when I saw the poster advertising MS-DOZ, a software IBM PC emulator, on the rear wall of the Robtek stand at the last Atari User show. My enquiries revealed that the arrival of the demonstration disk at Heathrow was delayed due to fog, and so I missed it. It was therefore a pleasant surprise to receive a copy for review.

To use MS-DOZ, you place the (copy protected) master disk in your drive A: and power up. After a while the screen clears and you are prompted to put your MS-DOS disk in drive B:. This is a requirement that I have not seen mentioned anywhere, least of all in Robtek's adverts so if you do not have a copy of MS-DOS you have problems already. Another problem is that if you want to use 3½ inch disks, you must have DOS 3.2 (the latest version, hereafter referred to as DOS) which is not very easy to get hold of.

Having armed myself with a copy of DOS 3.2, I started again. When MS-DOZ finds a good DOS disk, it asks two questions before starting operation and loading DOS, finally leaving you at the DOS 'A"' prompt. 'A:' in this case is the drive that is normally drive 'B:' on your Atari. The disk drives are swapped to make life easier for owners of 5¼ inch drives (me included).

The claimed speed of the MS-DOZ emulator is half that of the standard IBM-PC. As a regular user of PCs, I have to say that it feels slower. Certainly getting a directory takes a while, long enough to make you think twice before getting one. (There is, by the way, no support for hard disks.). The advertising mentions 'compatibility mode but I could not identify which mode this is. Modes are set by the two prompts at startup. The first is 'Keyflip (Y/N)?'. Keyflip is used when the program you are using 'appears not to work', i.e. when you hit a key you cannot get it to respond. In keyflip mode you have to press each key TWICE. That means that to type the word 'the', you would have to press the keys 'tthhee' – practical huh?. The other option is 'Interrupts (Y/N)?'. According to the manual, interrupts need only be used when running programs like Sidekick. No other information is given on this option.

I have referred above to the manual but I think 'manual' is a misnomer. The documentation is eight pages of what must be about A6 size. Page 1 is the cover, page 2 & 3 are the English instructions, 4 & 5 are German, pages 6 & 7 are the backup order form (backups cost £14.95) and guarantee registration card, and page 8 is blank. The English instructions are about as informative as the German (which I don't speak). Three paragraphs are dedicated to instructions for users with one drive, two drives and a Microbyte 5¼ inch drive. The remaining paragraph and sentence cover the keyflip and interrupt prompt respectively. Sparse is not the word!

COMPATIBLE SOFTWARE

The advertising for MS-DOZ lists a selection of software with which the emulator is said to be compatible. The first I tried was Wordstar (3.30), which after just a few 'tthhiiss iiss' type words came up with an internal error. Not too good. So I tried Sidekick. Sidekick (the original pop-up utility) certainly loads correctly, but I could not wake it. I thought that it may be the mode I was in, but it still remained dormant in each of the four possible modes. Turbo Pascal would not load at all, though that may have been my copy at fault as I have not used it on a PC in months. Also tried was the Microsoft C compiler version 4.00, but it failed to compile. By this time I was trying to pin down anything that I could definitely get to load and run. I have just spent 4 months writing a PC program, and thus I could guarantee that I would have a totally compatible program. It did run – very very slowly. The front page which draws a border and title took about a second, while normally it just 'appears'. When it got to the first input, it just hung. So hung that the normal Ctrl-Alt-Del reboot would not work. Again no mode made it work.

CONCLUSION

What can I say? MS-DOZ is a very clever piece of programming but from my experiments, I think that there is still work to be done, especially on the BIOS emulation (which would explain the lock-up in my program). The manual could be much better, and should give more detail on compatibility issues and options. I cannot understand how Robtek have managed to run their list of test software, yet I couldn't run any in the list that I have.

In general I would not advise anyone to buy this emulator without having the opportunity to try it on all programs you may wish to run. If you want to use a PC at home, it seems that the answer is still to buy an alternative program written for the ST, or buy a cheap PC compatible. If 'every once in a while' you need a very slow PC 'slightly compatible', then check out MS-DOZ at your local dealer and TRY OUT YOUR PROGRAM for at least half an hour. If it worked perfectly all the time, then buy it.

MICRO TIME CLOCK CARD.
Microdeal.

Reviewed by Mark Hutchinson

How many of you actually use or appreciate the time and date on your disks files? Probably not many, unless you are a programmer or, as in my case, have a lot of Word Processing files. Filenames are important and very helpful, but knowing which is the most current, if you update without changing the name, is extremely hard without a time stamp. I have therefore been very interested in a time card that would be onboard hardware as opposed to software.

Micro Time Clock Card comes in the standard Microdeal cardboard box, with a small booklet detailing all the necessary instructions for fitting and set up. A disk of assorted software, including public domain accessories, is included. The card is run by two AA rechargable batteries in a plastic holder. They are recharged whenever the ST is on, but I gave the batteries a four hour boost before using. If you decide to try this, make sure you have a charger set at the proper rate for these batteries.

The card is very simple to install, but if you are not sure about your ability to install the card please ask the shop where you purchased the card to install it for you. If you do decide to try it yourself remember that electronic devices are very sensitive to static. Earth yourself by touching the bare metal (e.g. screws) of a permanently earthed utility such as a cooker and do not use magnetised tools! The procedure is as follows. Switch off the ST and remove all leads. Open up the ST case by removing the small screws located underneath the case. Set aside the top cover and keyboard to reveal a large chip. This chip must be carefully (!) removed and inserted into the DIL socket on the clock card. The card must then be plugged into the empty socket on the computer. The ST can then be screwed together again and the system set up. This process will only take five to ten minutes and is fully documented.

The card is sturdy but the pins used are stiff and slightly bigger than normal. This meant taking longer than usual to insert the card pins into the socket, but it can be done with patience. A second card I tried had very bad pins, like fine nails, a couple of which had to be crimped to take out rough edges. There are special DIL packages for this type of application and it would have been better to use these rather than what is on the board.

Once the system was set, I tried out the software. I had some problems with certain programs and I contacted Microdeal. Mandy, who took over from Jenny Pope, was very helpful and despatched their updated card software that day. If you buy this package make sure that your retailer has the new software (it is time stamped for 19/1/87).

The software includes programs for colour or mono clocks, a digital clock, calendar, setup and palette programs. In all, fifteen files are on the disk. The ST control panel keeps good time as does the digital clock, but the PD program, GCLOCK.PRG, loses minutes pretty quickly. It sits out of the way at the top of the GEM window, but on a TOS screen such as STWRITER it is a real nuisance as it tends to mix with the text. You cannot complain, it *is* public domain!

The idea of the card is good and, apart from the pins, the PCB is well made. The timer seems to be accurate and stamps the files properly. The cost does seem a bit high considering there are so few components on the PCB, but it is far better to have a permanent clock set with the right time and date rather than search for the right disk and set the time and date whenever you switch on.

E-ZCALC
Royal Software

Reviewed by Alan Goldsbro

Spreadsheet programs are fast becoming an essential feature to any business currently interested in keeping simple cash flow analysis and financial projection. For most users of business computers, Lotus 123 is the industry standard, often bought but rarely used to it's fullest capabilities. To many home users, V.I.P professional (the Lotus 123 clone) seems to be out of reach because of it's price so, with this in mind, software houses have been producing affordable spreadsheet programs and E-ZCALC falls into the range of mid-priced software.

Making use of the Gem environment, E-ZCALC has mouse control, drop down menus and full use of all ten function buttons. Now don't get ahead of yourself, not all commands can be achieved by using the mouse and many need manual insertion to fully work. Extra features of E-ZCALC include a 10 key calculator and a handy note pad as desktop accessories. There's also a separate program to convert either Lotus 123 or V.I.P files to E-ZCALC format. The manual is a forty page mixture of tutorial and reference sections. The tutorial is a very simple financial template, which is adequate to get first timers going and gets you moving steadily along without being patronising.

E-ZCALC has just about all the general features required in a spreadsheet program including Loading and Clearing of files, Appending from cursor position, Save and Partial save. The Partial save will save a range of cells previously defined. Templates can be saved with Labels and Formulas intact. Save Text will save the file to ASCII format, however this cannot be re-loaded into E-ZCALC. Erase file and Rename file act as you'd expect. There are 264 columns and 999 rows in which to enter data and the columns can be sized either globally or singly but this has to be activated by using the drop down menu and not as you'd expect with the mouse by dragging the top cell to the required size. E-ZCALC doesn't have Macro capabilities, so consequently many keystrokes are needed to perform these functions.

If you wish to define a large group of cells for use with commands such as Replicate, Global Width, Comma, Dollar, etc the procedure is one of 'rubber banding'. This has to be done before you choose your option, then you select the required choice from the menu and click. Usually this will take you into a dialog box at the bottom of the screen which will ask for confirmation. You can also define cells by placing the cursor at the start cell and selecting an option from the menu bar which, again, will take you into a dialog box where you'll have to define the range manually. This is where you'd expect the Gem handling to be at it's best but unfortunately, unlike V.I.P/Lotus, where you would 'Anchor' the starting range and scroll down/across the sheet to the required cell and fasten everything down, E-ZCALC will not let you pull a cell into the dialog box. I found this most disturbing but only because I'm used to

the standard method of defining a range.

Using the mouse to 'Goto' a cell is obviously fast and if you wish to copy a cell then move the cursor to the cell you wish to copy and click while the Alternate key. The contents of that cell are copied to the edit box and pressing RETURN will place the contents in the new cell. Virtually the whole program takes on this kind of procedure, i.e. part mouse control and part manual keyboard insertion. It's this two handed system that makes a mockery of the title E-ZCALC. If you can't operate the program single handedly then what's the point of having a mouse!

Other facilities are. Freeze Titles – this keeps the row/column titles on the screen as you scroll through the spreadsheet. Insert will put blank row/column into the spreadsheet between existing cells.

Mathematical functions included are; Absolute Value, E to the power, Integer, Natural Logarithm, Logarithm and Square Root. Trigonometric functions are PI, SIN, COS, TAN, ASIN, ACOS and ATAN. Statistical functions supported are; SUM, MAX, MIN, COUNT, and AVERAGE. Financial, and Data Management functions are supported along with error trapping functions, these include Net Present Value and Lookup. The print menu has a fairly good selection of utilities and the print range can be selected by 'rubber banding' or from the print range dialog box. Headings and titles can be toggled on or off and grid follows the same format. Type styles include compressed, Elite, Pica and, if your printer supports it, N.L.Q.

Sixteen help boxes are available from the menu bar, once you load one of them from disk they'll all sit in memory but don't get the impression that they are intended as a substitute for the manual.

The conversion program from V.I.P to E-ZCALC worked a little strangely, it would only convert files and not templates. Any look-up formula in V.I.P wasn't converted and many of the mathematical functions were incorrectly converted. The majority of figures were rounded up to the nearest integer and the percentage formula was so mixed up that it would have meant financial ruin for anybody who dared to convert from V.I.P to E-ZCALC. There wasn't any provision to dump the contents to disk for graphical analysis nor to import data from other sources.

If you are looking for a stand alone spreadsheet program at a middle range price (approx £65) then E-ZCALC may be on your list, if on the other hand you think the capabilities of E-ZCALC are limiting then look at V.I.P where you'll get a whole lot more but at a price.

The Sprite Construction Kit
Microdeal

Reviewed by Matthew Jones

The Sprite Construction Kit (SCK), according to the packaging, is suitable for 'the easy design of images suitable for animation', it is said to output 'C', assembler and BASIC source (the latter is not true), and 'includes a full manual and example files'. Overall, the selling line is 'Design animated sequences for use in your own programs'. I received the review copy because I am a programmer, and thus could judge its value as such.

The program itself is quite usable. The screen is split into three windows, a large 'zoom' window in which editing is done, an 'actual' window in which the image is built up from six zoom windows, and an actual window sized clipboard (again in six editing parts). Along the top of the screen are the sixteen available colours (the program only works in low-resolution), and these colours can be changed as you wish. A nice touch is that you can set the colours to those stored in a NEO or DEGAS picture which allows you to match your sprites to your picture exactly.

Along the top of the screen is a standard GEM menu bar. This includes the following functions: Load a work file, Save a work file, Create a source file (C or assembler), Touch (load picture colours), Alter Colours, Move levels, Grid, Clear current object, Mode change, Edit objects, Sequence, and Go. Some of these are obvious, some not.

I said above that I was a programmer. Unfortunately, I am not highly versed in the technicalities of Sprite programming, and to understand and use this program you have to be. The manual is an abysmal 8 page, dot-matrix printed leaflet, that has not had a moments thought put into it. As I read it, it just threw terms at me (to paraphrase, 'the SCK can work in Level mode or Object mode. Up to 27 of the levels can be used'). No-one has considered that the user may not know what level and object modes are, or the difference between them (from using the program I still have not learnt, but they are apparently totally incompatible). Software such as this should TEACH the user. What I as a programmer want is a package I can pick up, read the manual, use the program, take the source, and have custom sprites in my program. I want it easy, and whilst I think that this program could go some way towards that, more time and effort should have been put into it before it was released.

Anyway, having thoroughly confused myself with the manual, I thought that I may find enlightenment by running the program. The examples show off the capabilities of the program well, and as I have said, the program is reasonable (though the method of opening the animation window is painfully slow and would aggravate over a long period of fine tuning). The Level/Object difference still did not become obvious, however.

Having failed to understand the principles of sprite programming from the program, I thought I would at least be able to try out the source generated by the examples, so I selected the appropriate option, and then quit the program. I showed the created file, and was amazed. All you get is a large mass of data array definition text. Nothing else. I have no idea what the format of it is (e.g. is it a byte of colour per pixel, or a colour plane, or how to alter the width?), or anything else about it. A check of the manual shows only how to create it, not how to use it.

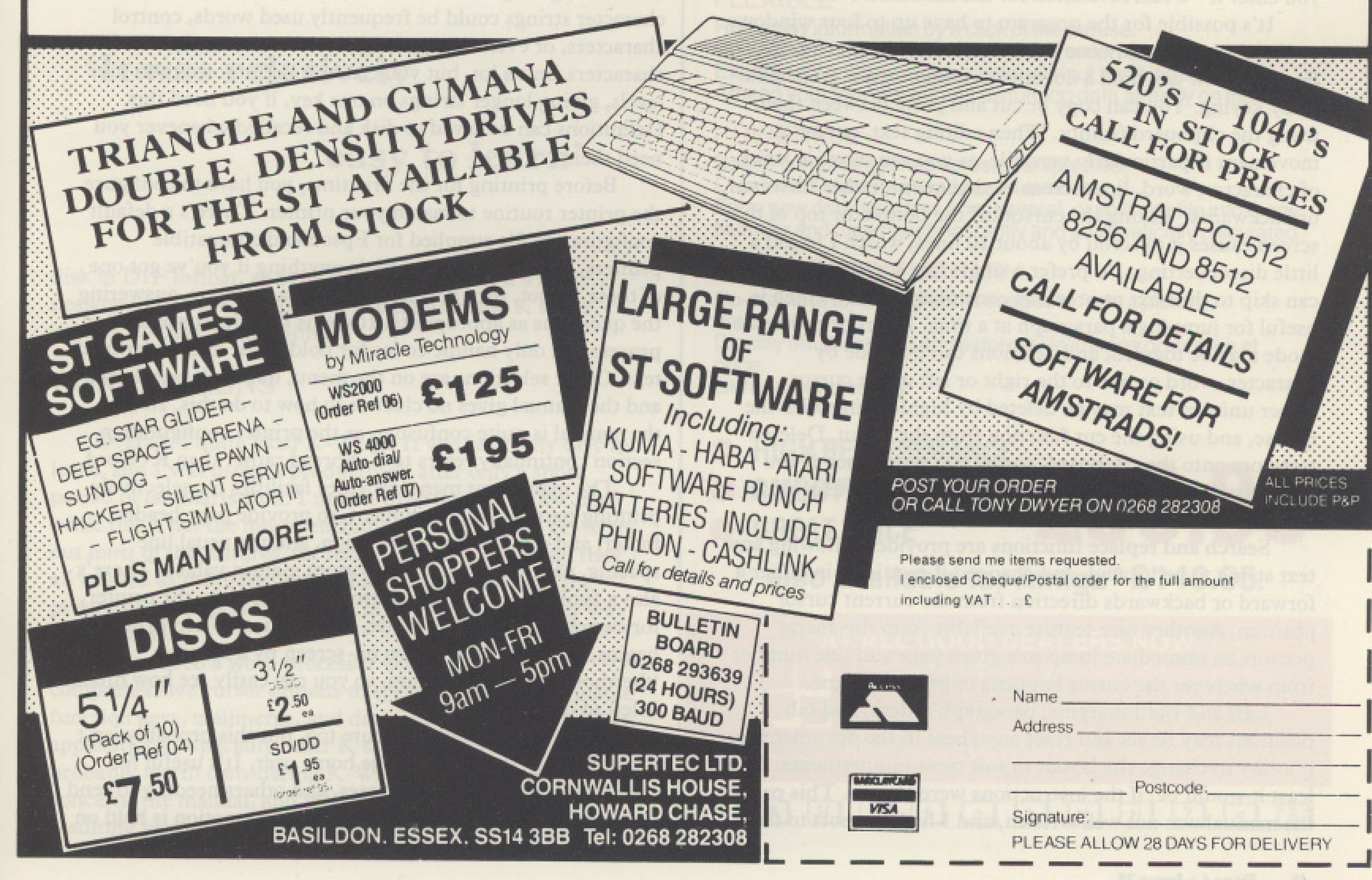
As a programmer I am embarrassed when products that I consider 'unfinished' are made available as it can only serve to make the purchaser feel that money was wasted. As I received it (a final version), it is not suitable for doing the job advertised. Microdeal may be producing a large number of programs, but quantity is nothing without quality. With 'Backup', I was prepared to put up with the faults because it was usable and essential but Sprite Construction Kit serves only to make me think twice when purchasing another Microdeal product. A great pity if one bad apple should spoil the barrel but then the onus should be on any company to ensure that the 'bad apples' are pruned out.

SUPERTEC ATARI USER OFFERS

SUPERTEC software for the ATARI ST

Title	Type	Inc VAT
Deadline	Entertainment	£22.95
The Pawn	Entertainment	£24.95
Red Alert	Entertainment	£24.95
Winter Games	Entertainment	£24.95
Golf	Entertainment	£29.95
Bridge	Entertainment	£29.95
Time Bandit	Entertainment	£29.95
Sundog	Entertainment	£29.95
Major Motion	Entertainment	£19.95
Deep Space	Entertainment	£34.95
Star Glider	Entertainment	£24.95
St Karate	Entertainment	£19.95
Temple of Apshai Trilogy	Entertainment	£24.95
Enchanter	Entertainment	£39.95
Cut Throats	Entertainment	£39.95
Bally Hoo	Entertainment	£39.95
Essex	Entertainment	£44.95
Brimstone	Entertainment	£44.95
A Mind Forever Voyaging	Entertainment	£44.95
Mind Shadow	Entertainment	£49.95
Borrowed Time	Entertainment	£49.95
World Games	Entertainment	£24.95
Strike Force Harrier	Entertainment	£24.95
Flight Simulator II	Entertainment	£49.95
Q-Ball	Entertainment	£19.95
Mercenary	Entertainment	£24.95

Title	Type	Inc VAT
Habaview	Database	£74.95
Kdata	Database	£49.95
T-R-I-M	Database	£89.95
H & D Base	Database	£99.95
dBman	Database	£149.00
Habadex	Database	£49.95
Print Master Gallery 1	Print Utility	£29.95
Print Master	Print Utility	£39.95
Music Studio	Music	£29.95
Paintworks	Graphics	£34.95
Degas	Graphics	£39.95
Degas Elite	Graphics	£69.95
Easy Draw	Graphics	£149.95
Colourspace	Graphics	£19.95
Cashlink Accounts	Accounts	£295.00
Habawriter	Word Processor	£59.00
KWord 2	Word Processor	£59.95
Boffin	Word Processor	£113.85
Hippopixel	Font Editor	£39.95
Habamerge	Mail Merge	£39.95
Kseka	Assembler	£49.95
KSpread 2	Spreadsheet	£79.95
PC Intercom	Comms	£129.95
KGraph 2	Bus. Graphics	£49.95
K Comm	Comms	£49.95
V.I.P. Lite	Spreadsheet	£99.95
Cornerman	Desk Accessory	£29.95



K-WORD
Kuma
£49.95

reviewed by John S Davison

K-Word is a GEM based word processing package from the growing K Series of 'ST Solutions' software from Kuma Computers. It is supplied in the standard K series packaging, a rather flimsy cardboard bookform affair, with pockets on the inside to take the slim, 36 page instruction manual and one single-sided disk. The disk holds the master copy of K-Word, and you have to make a working copy either on a hard disk or another floppy for general use. Kuma's protection system allows only this one working copy of the master to be made.

WYSI WHAT?

If like me you're new to the ST, and are used to 8-bit word processors, then K-Word comes as something of a culture shock. It uses the WYSIWYG (What You See Is What You Get) principle – your text prints out on paper exactly as you see it on the screen. Gone are the embedded control codes and the need to switch into preview mode to see the actual text layout. With K-Word you still key in control codes, but they take effect immediately. For example, Control-C causes the cursor to immediately jump to the centre of the input line, then any text you input gets centred in real time, as you key it in. Similarly, you can see the effect of bold, italic and underlined text right there on the screen as you enter it – a real revelation for the hardened 8-bit user!

It's possible for the program to have up to four windows open at once, but only one can be active at any given time. Each window can hold a document, either loaded from disk or by keying. You can copy or cut and paste between them using the clipboard facility. When editing text, cursor movement is particularly versatile, as you can move in units of character, word, line, screen or document, either forwards or backwards. Taking the cursor off the bottom or top of the screen causes it to scroll by about 10 lines, which I found a little disconcerting. I'd prefer a single line scroll. Also, you can skip to the next or previous control character, which is useful for jumping a paragraph at a time. Insert or overwrite mode may be toggled, and deletions can be made by character, word or line to the right or left of the cursor. Other units of text may be deleted by highlighting with the mouse, and using the cut function from the menu. Deleted text goes onto the clipboard, so you can put it back if you change your mind, or insert it elsewhere in your text using the paste function.

Search and replace functions are provided, allowing any text string to be located, and changed if required, in either a forward or backwards direction from the current cursor position. Another nice feature available from this menu permits an immediate jump to a given page and line number from wherever the cursor happens to be at that time.

Left and right margins, paragraph indent, and tab positions may be set and reset anywhere in the document, so it's easy to change the layout to suit most requirements. Or at least it would be, if the instructions were clearer. This part of the manual was not well written, and I had to resort to trial and error before I got things to work satisfactorily. The program's Help facility wasn't that helpful, either. Also, while struggling to master this area, I managed to inexplicably lose the document I was working on – several times!

DATA INTERCHANGE

The usual file operations are provided, allowing you to load and save your text to disk, with automatic backup of the previous version, if you want this. You can also load a file directly into another document at any point.

K-Word has two additional file functions, known as Give and Take. Their purpose is to allow the interchange of data in DIF or ASCII format between K-Word and other applications in the K series, or indeed any other ST application programs which can accept these formats. I tried it by passing text to 1st Word using the ASCII option, and it worked quite happily.

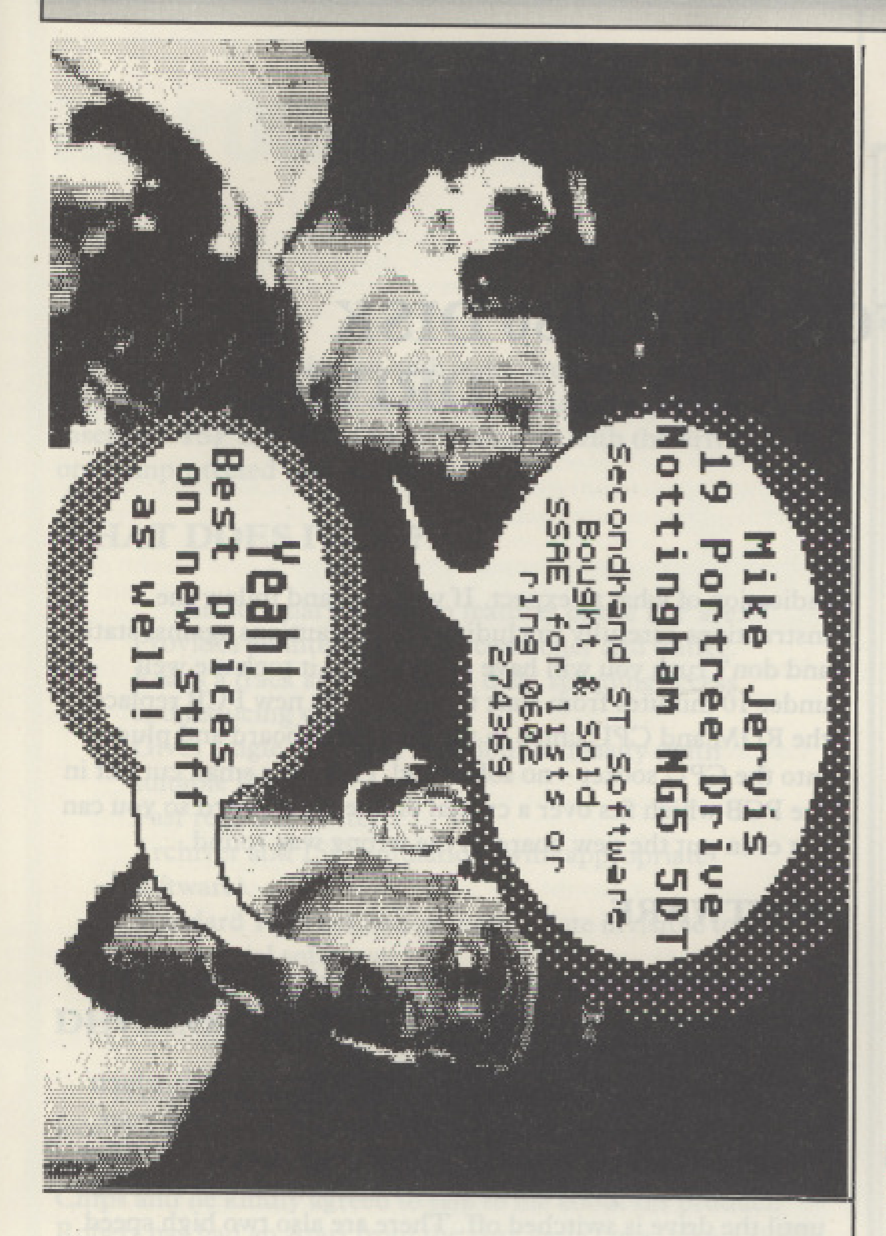
PROGRAMMABLE FUNCTION KEYS

Another useful feature of K-Word is its function key definition facilities, with which you can assign a string of up to ten characters to any function key. The keys can be used with shift, giving a total of twenty strings, if required. The character strings could be frequently used words, control characters, or even foreign language characters. Ten characters isn't a lot, but you can nest definitions up to four levels, giving longer strings on one key, if you need this. Definitions can be saved to disk and recalled whenever you need them.

Before printing for the first time, you have to configure the printer routine to match your printer. There's a default configuration file supplied for Epson and compatible printers, so you don't need to do anything if you've got one of these. If not, then you step through a dialogue, answering the questions as appropriate. It seems that the configuration process can only handle codes for bold, italic and underlined text. Other selections are on the menu, but can't be selected and the manual gives no clues as to how to do this. In fact, the manual is quite confusing, as the printer configuration section continually refers to K-Spread rather than K-Word.

The main print menu provides facilities for selectively printing parts of your document, to provide page header, footer, and numbering information, and the usual line spacing, page length and top/bottom margin values. There's also a facility for sending control codes direct to the printer, for switching it to NLQ mode, for instance. When printing begins, its progress is shown on-screen by a moving 'thermometer' type diagram, so you can easily see how much is left to print.

There's a mailmerge feature too, but this probably isn't of much interest to the average home user. It's useful for club secretaries, small businesses, and others needing to send out standard letters, though. Variable information is held on



'It was relatively easy to learn'

disk in DIF format, and the feature looks as if it's really designed to be used with other programs in the K series, such as K-Data and K-Spread.

CONCLUSIONS

Overall, I quite liked K-Word. It was relatively easy to learn, and I was using it productively after only a short period of familiarisation. I used it to write this review, and while that's not the most demanding of tasks, I did get to try out most of the features 'for real'. Generally speaking, they all worked as they should, but I did manage to crash the program on one occasion, and I'm still not sure how or why it happened.

If you need a word processor with such features as comprehensive cursor options to speed up editing, definable function keys, mailmerge, and data compatibility with other applications (especially other K series programs), then it's probably worth considering K-Word. My only real criticism concerns the manual, and if Kuma improved this the resulting package would be a reasonable buy at the price. •

I.S. PLATE

HARDWARE ADDITION FOR THE 1050 DISK DRIVE

Review by Ian Finlayson

I have owned an 810 drive for over three years now and it has given reliable service. I remember well the day it arrived and the excitement of its speed after using cassette tapes for some time – a whole new world of practical applications like word processing and accounting became a realistic proposition. Since then, of course, the new 1050 disk drive has come out with enhanced (one and a half times) density, and I have seen advertisements for various add-ons giving true double density and higher speed, but funds are finite and I could never really justify the expense of adding another drive. Recently, however, I do seem to make quite a lot of transfers from one disk to another in an effort to keep my expanding pile of disk files in some sort of order and then, after a recent article was published in Page 6 I swapped several disks with correspondents and two that arrived would not run on my 810 ... formatted in enhanced density! How galling!. I suppose I still cannot fully justify my recent purchase of a 1050 drive and the IS PLATE to fit in it, but I certainly have no regrets and I am happy to tell you more about it.

BEST OF BRITISH

I am very fortunate living near Worthing as we have an excellent, helpful, computer shop here – Chips – and it specialises in Atari computers and software. I recently saw an advertisement of theirs extolling the IS PLATE which interested me as it sounded a bit like the US Doubler, or Happy enhancement, but I had not heard of it before, even in the American Atari magazines, and nobody else was advertising it. So I dropped in at Chips to ask about it. It turned out that the Plate is a local product invented and developed here in Worthing. This device is British and follows up the recent expansion of good British software for the Atari in hardware terms, however, I wondered if it would be a useful addition to my computer system. With a price near a hundred pounds it is quite expensive compared to the cost of the disk drive itself or to the cost of a 130XE for that matter. Before my doubts could subdue my enthusiasm I was being given a demonstration combined with a good bit of informed salesmanship. My first impression of the machine was of speed and quietness and I was captivated.

PLATE HARDWARE AND INSTALLATION

The Plate itself is a small printed circuit board with five chips on it; these include a 6502 chip, 16K RAM and an EPROM. The device appears well engineered and professional with clean soldering. Installation is very straightforward and anyone who can change a mains plug should be able to tackle this with confidence. The instructions are clear and are supported by Xerox copies of photographs of the assembly process which, though not very clear, do give an adequate indication of what to expect. If you read and follow the instructions carefully (including the precautions against static) and don't rush you will have no trouble – it took me well under 10 minutes from start to finish. The new PCB replaces the ROM and CPU chips in the disk drive board and plugs into the CPU socket – no soldering! There is a small cut out in the PCB which fits over a crystal on the main board so you can not even put the new board in the wrong way round.

SOFTWARE

The IS Plate is accompanied by a disk of software for use with the device. On one side is the ISP driver while on side two is the IS Menu.

The ISP driver is a menu driven set of programs which are principally concerned with setting up the drive for your requirements. You can select Skew, Fast Write, Verify, Slow down and Write protect and these functions remain enabled until the drive is switched off. There are also two high speed copiers on the disk, one for 130XE and the other a general purpose copier. They are fast but will not copy protected disks.

You can also select to emulate the IS Doubler or a standard 1050 drive. This means that you can make the Plate invisible to commercial software that will not run on an enhanced drive.

The IS Menu (or Lighter Menu) is rather like Multiboot XL allowing several boot programs to be menu driven off one disk. It is colourful, has sound and a special character set and is based around a special DOS which only works with the Plate and gives a very fast load, something over twice the speed of Multiboot XL. Also on the menu is the IS Customiser – this is a utility which allows you to create your own custom disk formats with mixtures of different densities, bad sectors, duplicated sectors and extra sectors. If you are a skilled programer this means that you can protect your great works but a good knowledge of disk drives and operating systems is necessary if you are to make full use of this facility.

DOCUMENTATION

I can not go into detail of all the attributes of the Plate here so it is fortunate that the 26 page user manual is quite comprehensive. To begin with you will need to refer to it frequently and you will need further reference books to get the most out of this very versatile drive unless you already have a good knowledge of disk systems. The handbook introduces some of the more technical details needed to start programming the drive yourself, but such a task is certainly not for the beginner!

One very useful feature of the drive is not mentioned in the manual – the drive can be switched to standard 1050

emulation by switching on with write protect enabled (either by a write protected disk or an unprotected disk partially inserted). ISP is enabled by switching on with the drive empty or an unprotected disk installed.

WHAT DOES IT DO?

In summary the main features of the ISP are:

Provides an intelligent disk controller and buffer.

Reads a track at a time from disk, speeding access and reducing drive wear.

Gives single, dual and true double density (with suitable DOS).

Fast read and write.

Archiver and ISD emulation (with appropriate software).

Standard 1050 emulation makes Plate invisible to commercial software.

DEVELOPMENT

Having discovered that this device was designed and built locally I thought it would be interesting to meet the brains behind the product and coincidentally met Robert Perry in Chips and he kindly agreed to talk to me about his product. Robert has had an Atari from the very early days (about 1980) when he started with a 400 with 16K RAM and a cassette recorder at a cost of several hundred pounds! He clearly knows the anatomy of his Atari and disk drive inside out and has previously developed the IS Doubler which sold in small numbers, mostly locally, but was never advertised. He has been working on the Plate since about Easter of last year and showed me the prototype board on which the device was assembled and tested before the neat PCB design was developed and the boards made. Although he gets the PCBs made the rest of the work is his own, and a very professional job he makes of it. He is beginning to develop ideas for a sound sampler which will use the speed and power of the ST and a video flash digitiser or frame grabber which will digitise a frame of video transmission, possibly with video mixing, allowing computer generated graphics and computer manipulation of the frames for special video effects.

As well as informing me about his product, Robert tried to tell me more about disk formats, sector skew, disk protection techniques and so on, and I understood some of it. If you are knowledgeable in these areas then you will surely make good use of the plate. One factor that will be of interest to all Plate users is that the modification does not give much of a speed enhancement when used with an ordinary DOS such as DOS 2.5 but will read in a program on a disk formatted under SpartaDos just about twice as fast because the SpartaDos format matches the capabilities of the Plate.

If any of you develop software specially for this device I am certain Robert would like to hear from you. With the memory and intelligence that is built in there must be considerable potential ... could the Plate serve as a printer buffer for instance?

This is an excellent, innovative, well engineered product and I wish Robert every success in achieving a wide market. ●

THE RESOURCE FILE

The Resource File is a new service provided by PAGE 6 to help Atari owners (both 8-bit and ST) find sources of information, help and supply. An entry in this feature does not necessarily imply any endorsement by PAGE 6 and readers are advised to check for themselves to ensure that the information is still current. We would ask any readers who find information to be inaccurate or out of date to let us know so that an entry may be amended or deleted.

RETAILERS

The following retailers, to the best of our knowledge, support Atari 8-bit or ST.

ATARI WORLD
15, Fennell Street
Manchester
M4 3DU
Tel. 061 834 4941

BRIGHTON COMPUTER EXCHANGE
2, Ann Street
Brighton
BN1 4GP
Tel. 0273 686650

CHIPS
53, Rugby Road
Worthing
Sussex BN11 5NB

COMPUTER CENTRE
174, High Street
Hornchurch
Essex
Tel. 04024 75613

COMPUTER WORLD
212, Broad Street
Birmingham
B15 2AY
Tel. 021 643 9100

GAMER
71 East Street
Brighton
Sussex BN1 1HQ
Tel. 0273 728681

GAMES WORKSHOP
Unit 37, West Court,
Birmingham Shopping Centre
Birmingham 2
Tel. 021 632 4804

GAMES WORKSHOP
95, The Moor
Sheffield
Tel. 0742 750114

GAMES WORKSHOP
162, Marsden Way
Arndale Centre
Manchester
Tel. 061 832 6863

GAMES WORKSHOP
41a, Broadwalk
Broadmarsh Centre
Nottingham
Tel. 0602 585744

GLASGOW COMPUTER CENTRE
Virginia Galleries
33 Virginia Street
Glasgow
G1 1TU
Tel. 041 552 1522

GUERNSEY COMPUTERS LTD.
33, Commercial Arcade
St. Peter Port
Guernsey
Channel Islands
Tel. 0481 28738

HI-FI WESTERN LTD.
52, Cambrian Road
Newport
Gwent
Tel. 0633 62790

INTOTO
1, Heathcoat Street
Hockley
Notts. NG1 3AF
Tel. 0602 410987

JENNINGS STORES
244 – 248, Hertford Road
Enfield
Middx
Tel. 01 804 1767

LADBROKE COMPUTING LTD.
33, Ormskirk Road
Preston
Lancs. PR1 2QP
Tel. 0772 21474

LIVINGSTON COMPUTER CENTRE
17, The Mall
Craigshill Shopping Centre
Livingston
West Lothian
Tel. 0506 36978

MICROBYTE
71, Seaview Road
Liscard
Wallasey
Merseyside L45 4QW
Tel. 051 630 6933

MICRO-TRONICS
27a, Market Street
Tamworth
Staffs
Tel. 0827 51480

MIKES COMPUTER STORE
292, London Road
Westcliff-on-Sea
Essex SS0 7JJ
Tel. 0702 332554

P.F.MURPHY & SONS LTD.
Cross Lanes
Drogheda
Co. Louth
Ireland
Tel. 041 37292

ONE STEP BEYOND LTD.
11a, Castle Meadow
Norwich
NR1 3DG
Tel. 0603 663796

ORDEM
21, Harris Arcade
Reading
Berks. RG1 1DN
Tel. 0734 474768

PEATS ELECTRONICS
197, Parnell Street
Dublin 1
Ireland
Tel. 0001 727799

RADFORD HI-FI LTD.
52, Gloucester Road
Bristol
Avon
Tel. 0272 428247

SILICON CENTRE
7, Antigua Street
Edinburgh
Scotland
Tel. 031 557 4546

SOFTWARE EXPRESS
514 – 516, Alum Rock Road
Alum Rock
Birmingham B8
Tel. 021 328 3585

A.S. WOOTTON & SON
116, Edleston Road
Crewe
CW2 7HD
Tel. 0270 214118

YORK COMPUTER CENTRE
7, Stonegate Arcade
York
Tel. 0904 641862

The only criterion for an entry in this column is that the retailer must stock PAGE 6. That is the only measure we have that a retailer is genuinely interested in supporting Atari. Phone us on 0785 213928 if you wish to be included.

BBS

Name: Gamlingay FIDO
Number: 0767 50511

Hours: 24 hours
Baud: 300 – 2400
Features: Atari SIG and program library

Do you run a Bulletin Board which caters mainly for Atari 8-bit or ST? For an entry in this feature please send us details as above (5 words max on Features!) on a plain sheet of paper headed **RESOURCE FILE – BBS**.

Any background information included will be filed for reference but not published.

USER GROUPS

Name: CROMWELL ATARI USER GROUP
Contact: Dave Leggett
3, Chestnut Close
Brampton
Huntingdon
Cambs
Phone: 0480 50553
Members: All welcome

Name: LONDON ATARI CLUB
Contact: P.O. Box 22
Ilford
Essex
Phone: Send s.a.e.
Members: Anywhere inc. Europe, Australia, U.S.A.

Do you want others to know about your group? Send details as above ONLY (5 words max. on Members!) on a plain sheet of paper headed **RESOURCE FILE – USER GROUPS**.

That's all you get! We will not publish any other details as meeting times and places tend to change. Appoint someone responsible to handle any enquiries received.

HELPLINE

Do you have any special experience or knowledge that you would like to share with others? If you don't mind setting aside a few hours to answer the phone you could help other Atari owners solve their problems. We suggest that you set aside certain times during which you are willing to receive calls otherwise you may well be woken up in the middle of the night! Please restrict your help to one specialist subject and note that we will only accept one or two entries for each subject. Please supply the following details on a sheet of paper headed **RESOURCE FILE – HELPLINE**.

EXAMPLE ONLY
Name: Harry Clever
Telephone: 001 262 25252
Subject: ATARI BASIC programming
Hours: Mondays 7.30 p.m to 10 p.m. only

Be warned – you may still get the odd idiot phone at 6.30 a.m. on Sunday morning but you will certainly make more friends than enemies. Please do not put your name forward unless you are patient, understanding and really do know your stuff. We will emphasise in the column that readers should only phone at the times indicated so if you do get calls outside that time, feel free to tell them to go away!

IT'S UP TO YOU!

If you feel that your organisation should have an entry in this feature, write to us. Whilst we do have details of many other User Groups and Bulletin Boards we have not included these as we do not know if the details are correct.

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VIP PROFESSIONAL

THE POWER OF LOTUS 1-2-3™ ON THE ATARI ST

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ST SOFTWARE

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Probably the most impressive program to have been released so far for the Atari ST range, VIP Professional is an extremely easy to use, integrated spreadsheet, database and graphics program which is identical both in features and commands to Lotus 1-2-3™. To give you the best program possible on your Atari ST, VIP Professional integrates the three essential applications of Lotus 1-2-3™ with the smart face of GEM. The same spreadsheet analysis, information management and extraordinary business graphics are all combined in one easy to learn, affordable package. What's more, VIP Professional not only has all the features of 1-2-3™, you can also type the same commands to do the same things. Or, better still, you can use a mouse to make it even simpler! VIP requires only one disk drive to operate and also works with a hard disk drive. It is compatible with both monochrome and colour systems. Probably the most surprising feature of VIP Professional is not its total compatibility with Lotus 1-2-3™, nor its ease of use with the GEM environment, but its price. Lotus 1-2-3™ for the IBM PC AT costs £395 (+VAT=£454.25), whereas VIP Professional for the Atari ST range of computers is a mere £199 (+VAT=£228.85). That's nearly HALF PRICE!

INTEGRATED
SPREADSHEET
DATABASE
GRAPHICS
WITH
LOTUS 1-2-3
COMPATIBILITY

£199
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1 SPREADSHEET

VIP Professional was modelled after the powerful, best selling Lotus 1-2-3™ program. It has every feature, every command of that program. In fact, the experienced 1-2-3™ user will feel right at home using the same keystrokes. But this version is made even easier to use by adding the user friendly face of GEM, so the beginner can use it right away. If you want to do your home budgets, financial planning, or sophisticated business inventory control or budget modelling, VIP Professional will fit the bill. And you can freely use 1-2-3™ or VIP Professional files created on other computers in VIP Professional on your Atari ST. And Professional is not only flexible, it's powerful too, with a full 8,192 row by 256 column worksheet to use with up to a massive 4Mb of memory. (Note: Lotus 1-2-3™ has only 2,048 rows).

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- VIP Professional has 'Instant Help' so you can find more information instantly.
- VIP calculates to a full 300 digits against Lotus 1-2-3™ which only calculates to 100.
- VIP allows for 256 Query Fields against only 32 allowed by Lotus 1-2-3™.
- VIP has a complete GEM interface, for ease of use, unlike the text of Lotus 1-2-3™.
- VIP allows different fonts and has an on/off cell grid. Not found in Lotus 1-2-3™.
- VIP supports greater memory and larger spreadsheets than Lotus 1-2-3™.
- VIP graphs and worksheet can be viewed together. Pie charts can be exploded.
- VIP can accept any .WKS files from Lotus 1-2-3™ without modification.
- VIP displays all spreadsheet information in user-sizeable GEM windows.
- VIP can be manipulated using either the keyboard or the user friendly mouse.
- VIP is currently available for the AMIGA, ST and APPLE IIc, IIe and IIGS.

OFFICIAL UK VERSION

The official UK version of VIP Professional has a pound (£) sign as a standard part of its character set. Other versions have also been imported unofficially from the USA and have a dollar ($) sign instead of a £ sign. These versions will not be supported by the UK distributors or their dealers. Ensure that the VIP you buy is the official UK version, not an unofficial import with incorrect characters.



VIP Professional is available from Atari ST Dealers throughout the UK. If your local dealer does not have VIP in stock, it can be obtained by mail order (P&P free) from:

SILICA SHOP Ltd, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX   Tel: 01-309 1111

All comparisons made to Lotus 1-2-3™ are to version 1A.   E&OE

INFORMATION REQUEST FORM

To: Silica Shop Ltd, Dept PSIX 0587, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

Please send me further details of VIP Professional for the ST

Mr/Mrs/Ms: .... Initials: .... Surname: ....

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I am interested in the Atari ST .... ☐

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Computer GAMMON

a 1 or 2 player version of the famous board game

BEGINNING THE GAME: The program requires a minimum 24K RAM with 1 or 2 joysticks, has single and two player options and is compatible with both 400/800 and XL/XE machines. XE owners, however, may like to boost the colour saturation control on their TV for best effect.

After typing and saving the listing turn up the TV sound and RUN the program to initialise it. When the title screen appears enter each player's name (followed by the RETURN key), up to nine letters will be accepted. If you wish to play the computer enter ATARI for one of the sides or, for a demo of the program, you can even have the computer play itself by entering its name for both sides!

The blue player uses a joystick plugged into port 1, the green player uses one in port 2. If you only have one joystick and wish to run the two player version change the 'PLR' in line 400 to '0' – both players then use the same joystick plugged into port 1.

Once the board has been displayed press the trigger to begin.

OBJECTIVE: The objective is to remove all your tiles from the board before your opponent and, additionally, to attempt to manoeuvre his pieces to your advantage.

Tiles are moved around the board according to the throw of the dice, obeying certain rules. Blue moves clockwise in ascending fashion; green moves anti-clockwise and descends the pegs. Once all your tiles occupy the appropriately coloured pegs in the last six positions you may begin to move off the board.

RULES: A player cannot move his tile onto a peg which holds more than one of his opponent's pieces, nor can more than five tiles occupy any one peg. A solitary tile is vulnerable to attack and will be displaced onto the bar if hit by an opposing tile. In such a case a player must move his tile(s) back onto the board before any other move can be made – if unable to do so because of existing tile placements he forfeits his turn. No piece may be moved off the board by a player unless all his remaining tiles occupy the colour-coded pegs. Finally, providing moves are possible which do not infringe these rules, both dice must be used each turn – they can, however, be used in either order.

PLAYING THE DICE: The computer decides who will commence the game and throws the dice automatically at each turn. A player then has the option of moving two tiles by the value shown on each die (he could also move the same tile twice) or of moving one tile by the sum of the dice. For example, suppose a 3 and a 5 are thrown at the start of the game. You could move a tile from peg 13 to peg 10 (if you are green) and another from peg 24 to peg 19. You could, alternatively, opt to move a single tile from, say, peg 11 to peg 3 or the same tile from peg 24 to peg 16.

If you receive a double, each die is played twice. For example, a double 5 enables you to move 4 tiles 5 places each or 2 tiles by 10 places. You must, however, treat the dice as pairs – in other words you cannot play the 5 followed by the 10 followed by another 5.

Before returning control to you the computer will check for possible moves. If you cannot move according to the above rules you will be informed of this and play will be pass to your opponent.

MOVING THE CURSOR AND TILES: At the start of a game bring the cursor onto the screen by moving the appropriate joystick to the left. Then move the joystick in the required direction (except diagonally) to select the peg from which you wish to move a tile. Press the trigger to register your selection. If valid the marker below the board will move right asking for a destination for the tile. This you register in the same manner. If the move would be an invalid one both your peg selections are cancelled and you must make new entries. If you decide against a move after inputting a source value simply enter an invalid destination and start again. Your move will then take place with the used die, or dice, reducing in luminosity to highlight remaining choices.

If you are 'on the bar' the computer automatically registers this as the start point and you are only required to enter a destination. For example, with a 3 and a 5 thrown the blue player could enter the board (if valid) via pegs 3 or 5. The green player's corresponding pegs would be 22 or 20. To move off the board (numerically equal to '25' for blue and '0' for green) select the tile then position the cursor until the arrow symbol appears in the 'destination' box. Press the trigger to initiate the move.

During a game, providing you have control of the cursor, you may restart via the title screen by pressing the 'Start' key. Pressing 'Select' or 'Option' returns you to BASIC.

STRATEGY: This is an important feature of the game. You must decide if and when to deposit your opponent onto the bar remembering that he will re-enter via your inner quadrant in most cases. Figure out which are the safe moves to make, when to gamble and how to block your opponent's advances. As you manoeuvre your pieces around the board attempt to deposit your opponent on the bar when safe to do so but reduce his opportunities to re-enter with strategically placed tiles. At the close of the game points are scored according to the number and position of all remaining tiles, greater points being given for those furthest from the opponent's inner quadrant.

by David Hitchens

```
EI 1 REM ********************************
XB 2 REM *       COMPUTER GAMMON        *
TA 3 REM *                              *
TV 4 REM *  (c) DAVID HITCHENS 1986     *
TC 5 REM *                              *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ********************************
NO 9 REM
HU 10 GOTO 1000
EA 19 REM  FREQUENTLY USED SUBROUTINES 
AK 20 RESTORE A:FOR N=53760 TO 53768:READ D:POKE N,D:NEXT N:RETURN
EO 21 DATA 9,18,26,30,31,33,42,48,57,63,67,84,112,127,136,169,202,229,255
XA 22 DATA 0,0,166,166,117,0,16,0,43
TY 24 DATA 0,0,0,0,0,0,0,0,0
OZ 26 DATA 62,200,169,163,168,162,170,162,70
TP 28 DATA 62,199,33,163,168,162,170,162,71
AU 30 FOR N=I TO LEN(N$):? #6;CHR$(ASC(N$(N,N))+A);:NEXT N:RETURN
CQ 31 A=USR(ADR("h)♥ \P P4♦")):RETURN
IN 32 A=USR(ADR("h ♥9H/PHQ\Pv♦")):RETURN
YF 33 POKE 1758,120+8*(ROW=-I):SOUND I,PEEK(1771),H-I,H-I:A=USR(ADR("h)P t/ t/N t/-t/ ♥PHN\/Po♦")):RETURN
GT 34 SOUND I,PEEK(1771)+3,H-I,H+I:A=USR(ADR("h t/n\/-\/ ♥P |PIpPN♦")):SOUND I,0,0,0:RETURN
GK 35 FOR N=W TO 0 STEP -I:SOUND 0,0,A,N:POKE 712,250-N:NEXT N:RETURN
YE 40 D1=-D1:D2=-D2:D3=-D3:P1=0:P2=6:P3=0:P4=25:P5=-I:P6=7:RETURN
DF 45 DATA 20,2,23,2,26,2,20,0,23,0,26,0
IG 46 DATA 30,2,33,2,36,2,30,0,33,0,36,0
QW 50 IF ROW=I THEN PFX=2+3*(PEG-13):PFY=5+PG(PEG,PLR):PMX=56+12*(PEG-13):PMY=64+8*PG(PEG,PLR):RETURN
IE 55 IF ROW=-I THEN PFX=2+3*(12-PEG):PFY=18-PG(PEG,PLR):PMX=56+12*(12-PEG):PMY=184-8*PG(PEG,PLR):RETURN
RG 60 POKE 208,PMY:POKE 53249,PMX:BAR(PLR)=BAR(PLR)-I:RESTORE 45+PLR:POKE 182,2*BAR(PLR):READ B,C:BX(PLR)=B:BY(PLR)=C
CE 62 POSITION BX(PLR),BY(PLR):? "EG":A=H-I:GOSUB 35:RETURN
XG 65 GOSUB ZZ+I:POSITION DX,DY+ROW:? CHR$(243+PLR);CHR$(245+PLR):PG(PEG,PLR)=PG(PEG,PLR)+I:RETURN
ZK 70 POKE 1771,7:POKE 1706,0
FN 71 POSITION DX,DY+ROW:? CHR$(243+PLR);CHR$(245+PLR):PG(PEG,PLR)=PG(PEG,PLR)+I:PG(PEG,I-PLR)=PG(PEG,I-PLR)-I
VV 72 RESTORE 46-PLR:POKE 182,2*BAR(I-PLR):READ B,C:BX(I-PLR)=B:BY(I-PLR)=C:BAR(I-PLR)=BAR(I-PLR)+I
IK 73 GOSUB 33:GOSUB 32:POKE 1706,118+64*(I-PLR):A=USR(PM+512):GOSUB 34:GOSUB 31:A=O:GOSUB 35
LR 74 POSITION BX(I-PLR),BY(I-PLR):? CHR$(244-PLR);CHR$(246-PLR):RETURN
HA 75 PG(PEG,PLR)=PG(PEG,PLR)+I:IF PG(PEG,PLR)=W THEN WIN=I:GOSUB 750:A=USR(ADR("h d b \ \5♦")):POKE 54286,64:GOTO 5000
ZF 77 FOR N=W TO 0 STEP -I:SOUND 0,PEEK(53770)/H,10,N:NEXT N:RETURN
WS 80 POSITION SX,SY:? "dd":GOSUB ZZ+I+I:PG(D4,PLR)=PG(D4,PLR)-I:A=USR(PM+512):RETURN
AG 99 REM  COMPUTER LOGIC 
CI 100 IF BAR(PLR)=0 THEN 120
TW 105 FOR J=110 TO 114 STEP I+I:GOSUB R:NEXT J
UV 110 IF PG(P4+D5,I-PLR)=I THEN 195
ZC 111 RETURN
ZY 112 IF PG(P4+D5,PLR)=I THEN 195
ZI 113 RETURN
HM 114 IF PG(P4+D5,PLR)<H AND PG(P4+D5,I-PLR)=0 THEN 195
ZO 115 RETURN
EQ 120 IF K<>W THEN 140
JD 125 J=130:GOSUB R:GOTO 135
GA 130 IF PG(P3-D5,PLR) THEN 196
ZG 131 RETURN
QC 135 J=136:GOSUB R:GOTO 185
QS 136 FOR N=P1 TO P2:IF PG(N,PLR)=0 AND PG(N,I-PLR)=0 AND PG(N-D5,PLR)>0 THEN 194
PG 137 NEXT N:RETURN
VX 140 IF BAR(I-PLR) THEN 170
FF 145 C0=0:C1=0:FOR N=P4 TO P3 STEP P5
FJ 146 C0=C0+PG(N,PLR):C1=C1+PG(N,I-PLR)
RT 147 IF C1<W THEN NEXT N
LJ 148 POP :IF C0 THEN 170
PX 150 J=152:GOSUB R:GOTO 186
SF 152 P7=P6+D5:IF P7>24 OR P7<I THEN P7=P3-P5
JS 155 FOR N=(P6+P5) TO P7 STEP P5:IF PG(N,PLR)<H AND PG(N-D5,PLR)>0 THEN 194
PH 156 NEXT N:RETURN
MB 160 IF D1<>ZZ THEN D5=D1:GOSUB J
NL 161 IF D2<>ZZ THEN D5=D2:GOSUB J
OV 162 IF D3<>ZZ THEN D5=D3:GOSUB J
ZS 163 RETURN
LU 165 P8=P6:IF RND(0)>0.75 THEN P8=P3-P5
AB 166 RETURN
LN 167 FOR N=(P4+P5) TO (P6-3*P5) STEP P5
PW 168 TRAP 169:IF PG(N,PLR)=I AND PG(N+D
```

→

WINNER: The winner's performance is evaluated in three ways in order to offer different 'goals' when playing against the computer. Tile advantage is simply the number of your opponent's pieces remaining on the board at the end of a game. Total moves is self-evident – the lower the value the more effective has been your strategy. The score is based on the number and position of remaining tiles; high scores result from keeping your opponent away from his inner quadrant. As is usual with games involving dice, luck does play its part but certainly not to the exclusion of a good strategic approach.

GAME DESIGN

It was decided at the outset to use a character-mapped screen for the board and Antic 4 was chosen since this gives 5 colours at a resolution equivalent to BASIC's mode 7.5. It does, of course, require some effort in redesigning the character set. The number characters were additionally altered for greater prominence but they reside on Gr.0 lines above and below the board itself. DLI's were incorporated to permit multiple use of Players and colour registers. The dice illusion is achieved by overprinting two players with appropriate substrings from DICE$. The cursor is pulsed via a simple VBI but, because it is the same player as used for one of the dice, its position and priority must be adjusted in one of the DLI's. An expanded display results from the use of Players to extend the horizontal boundaries of the board and the inclusion of Graphics 1 and 2 lines below the board which gives prominence to the displayed information.

THE JOYSTICK ROUTINE was then added, positioning this some way in to the BASIC listing in order to give a built-in delay to cursor movement. Any routine positioned near the start of a listing will operate more quickly than if located at the end – hence the positioning of 'frequently used subroutines' in lines 10 to 100 in this game.

TILE MOVEMENT AND GAME CONTROL came next using a simple array to keep track of players' tiles and the program was extensively play-tested before adding m/code subroutines to smooth out movement of the tiles. In order to compact the program a series of variables was incorporated to make one master routine in the main loop operate for both players. Since the green player operates in a numerically descending manner this involved an inversion of blue-player logic.

THE COMMON INTRO/EXIT SCREEN uses a mixed-mode display list with title displayed in Antic 5. Careful choice of foreground colours whilst pulsing the background in a VBI results in good legibility of the standard character set.

COMPUTER LOGIC (for the single player version) was kept fairly simple in order to restrict 'thinking time' but it nevertheless plays fairly intelligently and it isn't a simple matter of achieving high scores. Routines were placed near the start of the program for optimum processing speed, their addition significantly reduced cursor speed as described earlier. ●

```
   5,PLR)<H AND PG(N+D5,I-PLR)=O AND N+D5
   <25 AND N+D5>O THEN 197
IW 169 TRAP 40000:NEXT N:RETURN
UU 170 GOSUB R+H:J=175:GOSUB R:J=167:GOSU
   B R:GOTO 185
ZO 175 FOR N=(P4+P5) TO P8 STEP P5
JM 176 TRAP 182:IF PG(N,PLR)>I+I AND PG(N
   +D5,I-PLR)=I THEN 197
XK 177 IF PG(N,PLR)>I+I AND PG(N+D5,PLR)=
   I THEN 197
AK 178 IF PG(N,PLR) AND PG(N+D5,PLR)=I TH
   EN 197
CU 179 IF PG(N,PLR) AND PG(N+D5,I-PLR)=I
   THEN 197
GL 180 IF PG(N,PLR)=I AND PG(N+D5,PLR)<H
   AND PG(N+D5,PLR)>O THEN 197
IF 182 TRAP 40000:NEXT N:RETURN
SV 185 J=188:GOSUB R
QV 186 J=191:GOSUB R
RO 188 FOR N=(P4+P5) TO (P3-P5) STEP P5
VP 189 TRAP 190:IF PG(N,PLR)>I+I AND PG(N
   +D5,PLR)<H AND PG(N+D5,PLR)>O AND N+D5
   <25 AND N+D5>O THEN 198
IB 190 TRAP 40000:NEXT N:RETURN
QV 191 FOR N=(P4+P5) TO (P3-P5) STEP P5
YC 192 TRAP 193:IF PG(N,PLR) AND PG(N+D5,
   PLR)<H AND PG(N+D5,I-PLR)<I+I AND N+D5
   <25 AND N+D5>O THEN 198
IK 193 TRAP 40000:NEXT N:RETURN
SD 194 POP :POP :POP :S1=N-D5:S2=N:RETURN
GO 195 POP :POP :POP :S1=P4:S2=P4+D5:RETU
   RN
XK 196 POP :POP :S1=P3-D5:S2=P3:RETURN
QZ 197 TRAP 40000:POP :POP :POP :S1=N:S2=
   N+D5:RETURN
RC 198 TRAP 40000:POP :POP :POP :S1=N:S2=
   N+D5:RETURN
XF 199 REM  MAIN LOOP 
OT 200 POKE 1704,5:MVS=MVS+I:POSITION H-(
   MVS>9)-(MVS>99),21:? MVS:IF  NOT O THE
   N PLR=I-PLR
QT 205 N=118+64*PLR:POKE 706,N:POKE 707,N
   :POSITION 0,22:? NAME$(10*PLR+I,10*PLR
   +10):GOSUB 500
EP 210 POSITION 11,Z+I:? " from  to ":POSIT
   ION 17,22:? "  ":SHOW=12:FOR N=5 TO 14
   0 STEP -I:POKE 1704,N:NEXT N:GOSUB 600
OF 214 REM  CHECK FOR IMMOVABILITY 
PX 215 K=0:FOR N=P1 TO P2:K=K+PG(N,PLR):N
   EXT N:IF K<>W THEN 240
HG 220 FOR N=P1 TO P2:IF PG(N,PLR) THEN 2
   30
LC 225 NEXT N:GOTO 245
VV 230 IF D1=P3-N OR D2=P3-N OR D3=P3-N T
   HEN 275
PQ 235 GOTO 225
BR 240 IF BAR(PLR) THEN N=P4:GOTO 255
DZ 242 IF BAR(I-PLR)=H+I THEN 270
OJ 245 FOR N=I TO 24:IF PG(N,PLR) THEN 25
   5
JE 250 NEXT N:GOTO 270
RC 255 TRAP 260:IF N+D1<25 AND N+D1>O AND
   PG(N+D1,PLR)<H AND PG(N+D1,I-PLR)<I+I
   THEN 275
ZE 260 TRAP 265:IF N+D2<25 AND N+D2>O AND
   PG(N+D2,PLR)<H AND PG(N+D2,I-PLR)<I+I
   THEN 275
GM 265 TRAP 266:IF N+D3<25 AND N+D3>O AND
   PG(N+D3,PLR)<H AND PG(N+D3,I-PLR)<I+I
   THEN 275
UR 266 TRAP 40000:IF N=P4 THEN 270
PE 268 GOTO 250
VF 270 GOSUB 700:GOTO 200:REM  NO MOVE! 
MX 274 REM  A MOVE IS POSSIBLE 
SK 275 TRAP 40000:POP :IF BAR(PLR) THEN P
   OSITION SHOW,22:? "[]":SX=BX(PLR):SY=B
   Y(PLR):D4=P4:GOTO 300
SM 279 IF AUTO=PLR+3 OR AUTO=H THEN GOSUB
    100:PEG=51:GOSUB 770:GOTO 285
AS 280 GOSUB Z*Z
TS 285 IF PEG(I OR PEG)24 THEN 280
IK 290 IF PG(PEG,PLR)=0 THEN 280
DD 295 GOSUB ZZ+Z:D4=PEG:SX=PFX:SY=PFY:SM
   X=PMX:SMY=PMY
BY 300 SHOW=17:FOR N=140 TO 180:POKE 1704
   ,N:NEXT N:S=N-I:GOSUB 600
GM 302 IF (AUTO=PLR+3 OR AUTO=H) AND BAR(
   PLR) THEN GOSUB 100
TV 304 IF AUTO=PLR+3 OR AUTO=H THEN PEG=5
   2:GOSUB 770:GOTO 307
AS 305 GOSUB Z*Z
HR 307 GOSUB ZZ+Z:DX=PFX:DY=PFY:PMY=PMY+8
   *ROW
ON 310 D5=D1:L=I:GOSUB 350:D5=D2:L=I+I:GO
   SUB 350:D5=D3:L=I+I+I:GOSUB 350:GOTO 2
   10
AA 350 IF BAR(PLR) AND PEG<>D4+D5 THEN RE
   TURN
UY 351 IF PEG=P3 AND K<>W THEN RETURN
JG 352 IF PEG<>D4+D5 THEN RETURN
TT 353 IF (PG(PEG,PLR)=H AND PEG<>P3) OR
   PG(PEG,I-PLR)>I THEN RETURN
EM 354 POP :POKE 208,SMY:POKE 53249,SMX:P
   OKE 1706,118+64*PLR:POKE 1756,SMX:POKE
    1757,PMX:POKE 1758,PMY
BE 355 IF PEG=P3 THEN POKE 1771,W:POKE 17
   57,SMX:GOSUB 33:GOSUB 80:GOSUB 34:GOSU
   B 31:GOSUB 75:GOTO 380
TA 360 IF BAR(PLR) AND PG(PEG,I-PLR)=I TH
   EN POKE 1756,PMX:POKE 1758,120+8*(ROW=
   -I):GOSUB 60:GOSUB 70:GOTO 380
OD 365 IF BAR(PLR) THEN GOSUB 60:GOSUB 65
   :GOTO 380
CZ 370 IF PG(PEG,I-PLR)=I THEN GOSUB 80:G
   OSUB 70:GOTO 380
FN 375 GOSUB 80:GOSUB 65
KS 380 ON L GOTO 384,385,386
ET 384 POKE 706,PEEK(706)-6:D1=ZZ:D3=ZZ:G
   OTO 390
HE 385 POKE 707,PEEK(707)-6:D2=ZZ:D3=ZZ:G
   OTO 390
JP 386 POKE 706,PEEK(706)-6:POKE 707,PEEK
   (707)-6:D1=ZZ:D2=ZZ:D3=ZZ
XP 390 POKE 1771,H-I
CS 391 IF D1=ZZ AND D2=ZZ THEN GOSUB 8500
   :GOTO 200
RZ 392 S=180:GOTO 210
AC 395 RETURN
SB 399 REM  SELECT TILE 
YC 400 ST=STICK(PLR):OLDPEG=PEG
DJ 405 IF PEEK(53279)<7 THEN POP :GOTO 80
   90
PQ 410 IF ST=13 AND ROW=I THEN ROW=-I:PEG
   =25-PEG
ZY 420 IF ST=14 AND ROW=-I THEN ROW=I:PEG
   =25-PEG
OK 430 IF ST=7 THEN PEG=PEG+ROW-(PEG=25)+
   (PEG=0)
MP 440 IF ST=11 THEN PEG=PEG-ROW
PQ 480 ROW=(PEG>12)-(PEG<13)
AT 490 IF PEG<>OLDPEG THEN SOUND 0,25+2*P
   EG,10,H:GOSUB 600:SOUND 0,0,0,0
AA 495 IF STRIG(O) AND STRIG(I) THEN 400
AQ 498 RETURN
MH 499 REM  THROW DICE 
AZ 500 IF O THEN D1=D1A:D2=D2A:D3=D1+D2:I
   F PLR THEN GOSUB Z+Z
JM 502 IF O THEN O=0:RETURN
ZM 505 POKE 1703,I:T=Z*RND(O)+10:O=O
QW 510 FOR N=I TO T:D1=INT(6*RND(O)):D2=I
   NT(6*RND(O))
QW 520 SOUND 0,D1,H+I,11:POSITION H+I,0:S
   OUND 0,0,0,0
CX 530 ? DICE$(D1*17+I,D1*17+17);"++++";D
   ICE$(D2*17+I,D2*17+17)
IB 540 NEXT N
UK 550 D1=D1+I:D2=D2+I:D3=D1+D2:POKE 1703
   ,O:IF D1=D2 THEN O=I:D1A=D1:D2A=D2
JM 560 IF PLR THEN GOSUB Z+Z
RD 570 IF  NOT PLR THEN P1=19:P2=25:P3=P2
   :P4=0:P5=I:P6=18
PW 580 POKE 77,0:RETURN
JH 599 REM  POSITION PEG MARKER 
LJ 600 XLOC=PEG:IF PEG<13 THEN XLOC=25-PE
   G
OG 610 XLOC=45+(XLOC-13)*12:Y1=(ROW=I):Y2
   =(ROW=-I)
HO 620 POKE PM+1860,Y1:POKE PM+1861,Y1:PO
   KE PM+1981,Y2:POKE PM+1982,Y2
WQ 630 POKE 1705,XLOC
FD 640 POSITION SHOW,22:IF PEG=0 OR PEG=2
   5 THEN ? "[]";:GOTO 670
TK 650 IF PEG<10 THEN ? "0";
WG 660 ? PEG;
ZQ 670 RETURN
PH 700 S=240:POKE 1704,S:POSITION 10,Z+I+
   I:? " NO  MOVE":GOSUB 8500:IF K<>W THE
   N GOSUB 8500:GOSUB 8500
KD 715 POSITION 10,Z+I+I:? "        ":RE
   TURN
BH 750 FOR N=W TO 0 STEP -0.5:POKE PM+Z,N
   :SOUND 1,8,8,N:SOUND 2,12,8,N:SOUND 3,
   4,8,N:NEXT N:RETURN
LY 770 ROW=(PEG>12)-(PEG<13):GOSUB 600:FO
   R N=W TO 0 STEP -H:SOUND 0,Z+2*PEG,10,
   N:NEXT N:RETURN
XP 999 REM  ASSIGN MEMORY/INITIALISE 
QR 1000 O=0:I=1:H=5:W=15:Z=20:ZZ=30:R=160
   :SOUND 0,0,0,0:GRAPHICS 0:POKE 752,I:P
   OKE 709,0:POKE 710,0
PR 1010 MEM=PEEK(106):CHB=MEM-8:CH=CHB*25
   6:PMB=MEM-16:PM=PMB*256
MQ 1020 DL=PEEK(560)+256*PEEK(561)+6:POKE
    DL,7:POKE DL+H,H+I:? :? " initialisi
   ng"
MN 1060 DIM DICE$(102)
VG 1070 DICE$="     ++++ [] ++++     [] ++++
     ++++ [] [] ++++ [] ++++ [] [] []++++  +++
   +[] [] []++++ [] ++++[] [] []++++[] []++++[] []
   "
BE 1080 DIM PG(55,I),BAR(I),BX(I),BY(I),M
   S(9),NAME$(Z+Z)
NM 1100 IF PEEK(PM)=72 THEN 1990
SN 1150 DIM CH$(34):CH$="h),K,H)(,Lhh,N"
   {1K,MHPyfl fN.JPr+":A=USR(ADR(CH$),CHB
   )
FJ 1190 A=Z+I+I:GOSUB Z:RESTORE 1210:POKE
    709,10
TF 1199 REM  NEW CHARACTERS 
PS 1200 FOR T=I TO 52:READ DT:POSITION ZZ
   -I,H:? 52-T;" ":FOR N=0 TO 7:READ D:PO
   KE CH+N+8*DT,D:NEXT N:NEXT T
JD 1210 DATA 97,255,255,255,255,255,255,6
   3,15
PG 1215 DATA 98,255,255,255,255,255,255,2
   52,240
OH 1220 DATA 99,255,255,255,255,195,0,0,0
KC 1225 DATA 100,3,3,3,3,3,3,3,3
DU 1230 DATA 101,192,192,192,192,192,192,
   192,192
DO 1235 DATA 102,255,255,255,255,3,0,0,0
RI 1240 DATA 103,255,255,255,255,255,252,
   252,252
CK 1245 DATA 104,255,252,240,252,255,252,
   240,252
NY 1250 DATA 105,15,63,255,255,255,255,25
   5,255
BP 1255 DATA 106,240,252,255,255,255,255,
```

```
255,255
XF 1260 DATA 107,0,0,0,195,255,255,255,255
ZL 1265 DATA 108,0,0,0,3,255,255,255,255
BP 1270 DATA 109,252,252,252,255,255,255,255,255
ZY 1275 DATA 110,255,255,255,255,192,0,0,0
BQ 1280 DATA 111,255,255,255,255,255,63,63,15
VC 1285 DATA 112,63,255,63,15,63,255,63,15
IB 1290 DATA 113,15,63,63,255,255,255,255,255
UQ 1295 DATA 114,0,0,0,192,255,255,255,255
GL 1300 DATA 115,3,5,21,85,85,21,5,3
QC 1305 DATA 117,192,80,84,85,85,84,80,192
YS 1310 DATA 116,3,10,42,170,170,42,10,3
UR 1315 DATA 118,192,160,168,170,170,168,160,192
ZJ 1320 DATA 16,0,60,102,102,102,102,102,60
JS 1325 DATA 17,0,24,120,24,24,24,60,126
YW 1330 DATA 18,0,60,102,12,24,48,96,126
BI 1335 DATA 19,0,60,102,6,28,6,102,60
FM 1340 DATA 20,0,28,60,108,236,254,12,12
VR 1345 DATA 21,0,126,96,124,6,6,102,60
UV 1350 DATA 22,0,12,24,48,124,102,102,60
GX 1355 DATA 23,0,126,102,6,12,24,48,96
GL 1360 DATA 24,0,60,102,102,60,102,102,60
JX 1365 DATA 25,0,60,102,102,62,12,24,48
SB 1370 DATA 3,255,255,255,255,255,255,255,255
IY 1375 DATA 4,240,240,240,240,252,252,252,252
BI 1380 DATA 5,252,252,252,252,240,240,240,240
TB 1385 DATA 6,15,15,15,15,63,63,63,63
NH 1390 DATA 7,63,63,63,63,15,15,15,15
MI 1395 DATA 8,3,3,3,255,255,3,3,3
GI 1400 DATA 9,240,240,252,252,255,255,255,255
AN 1405 DATA 10,15,15,63,63,255,255,255,255
ZB 1410 DATA 11,0,0,60,60,60,60,0,0
JC 1415 DATA 119,192,192,192,255,255,192,192,192
NA 1420 DATA 61,0,192,240,252,254,252,240,192
HE 1425 DATA 59,0,0,0,127,127,127,0,0
UO 1430 DATA 65,1,1,0,0,0,0,0,0
JU 1435 DATA 66,64,64,0,0,0,0,0,0
YP 1440 DATA 67,0,0,0,0,0,0,2,2
LR 1445 DATA 68,0,0,0,0,0,0,128,128
ZY 1450 DATA 69,0,192,0,192,0,192,0,192
CR 1455 DATA 70,0,3,0,3,0,3,0,3
PH 1457 DATA 28,0,113,91,90,114,91,90,114
TD 1458 DATA 30,0,156,210,82,92,212,82,82
UZ 1599 REM DLI'S
LW 1600 RESTORE 1620
SC 1610 POKE 708,198:POKE 53762,92:FOR N=0 TO 146:READ D:POKE PM+N,D:POSITION ZZ-I,H:? 146-N;" ":NEXT N
MY 1620 DATA 72,169,20,141,10,212,141,20,208,169,40,141,6,208,169,208,141,2,208,169,0,141,26,208
DF 1625 DATA 169,0,141,27,208,169,30
ZP 1630 DATA 141,25,208,173,166,6,141,21,208,173,169,6,141,3,208,165,20,141,18,208,173,170,6,141,19,208,169,64,141,0
EV 1640 DATA 2,104,64,72,169,176,141,10,212,141,26,208,173,164,6,141,23,208,169,86,141,25,208,169,4,141,27,208
HR 1650 DATA 169,148,141,21,208,169,68,141,3,208,169,3,141,11,208,141,10,208,169,230,141,22,208,169,119,141,0,2,104
WU 1660 DATA 64,72,169,8,141,10,212,141,22,208,173,165,6,141,24,208,169,52,141,20,208,173,168,6,141,2,208,104,64
HG 1665 FOR N=0 TO 54:READ D:POKE PM+256+N,D:NEXT N
RJ 1675 DATA 72,230,203,165,203,141,10,212,41,31,141,26,208,169,54,141,22,208,169,25,141,0,2,104,64
RU 1685 DATA 72,169,0,141,10,212,141,26,208,169,41,141,0,2,104,64
LO 1695 DATA 72,169,0,141,10,212,141,22,208,141,24,208,104,64
IC 1699 REM VBI
MN 1700 RESTORE 1720
QR 1710 POKE 708,136:POKE 53762,72:FOR N=0 TO 102:READ D:POKE 1536+N,D:POSITION ZZ-I,H:? 102-N;" ":NEXT N
WU 1720 DATA 104,162,6,160,11,169,7,32,92,228,96
HF 1730 DATA 169,0,141,0,2,141,4,208,141,5,208,173,164,6,24,105,16,141,164,6,165,1,141,2,208,24,105,20,141,3,208
EW 1740 DATA 173,10,210,141,165,6,141,18,208,141,19,208,198,0,165,0,208,4,169,12,133,0,141,166,6
DC 1750 DATA 169,1,141,10,208,141,11,208,173,167,6,240,10
XA 1760 DATA 169,56,141,4,208,169,116,141,5,208,165,1,240,6,201,70,240,2,230,1
YJ 1770 DATA 76,98,228
CP 1780 FOR N=1650 TO 1691:READ D:POKE N,D:NEXT N
VC 1790 DATA 198,205,208,30,169,2,133,205,165,204,24,101,1,141,196,2,201,92,208,4,162,255,134,1,201,80,208,4,162,1
CA 1800 DATA 134,1,133,204,169,0,141,0,2,76,98,228
NX 1810 RESTORE 1830
EX 1820 POKE 708,234:POKE 53762,54:FOR N=0 TO 117:READ D:POKE PM+512+N,D:POSITION ZZ-I,5:? 117-N;" ":NEXT N
VM 1830 DATA 104,169,197,141,5,210,141,7,210,169,33,141,8,210,169,0,133,7,173,220,6,141,4,210,205,221,6,240,26
RU 1835 DATA 176,12,32,224,6,238,220,6,173,220,6,24,144,9
GV 1840 DATA 32,224,6,206,220,6,173,220,6,141,1,208,165,208,141,6,210,205,222,6,240,39,176,19,32,224,6,160,10
JG 1850 DATA 177,208,200,145,208,136,136,208,247,230,208,24,144,18,32,224,6,160,1,177,208,136,145,208,200,200
HB 1860 DATA 192,10,208,245,198,208,165,7,208,162,141,5,210,141,7,210,141,8,210,96
OE 1865 POKE 53762,36:POKE 708,72
LS 1870 RESTORE 1880:FOR T=I TO W:READ A,B,C,D:FOR N=A TO B:POKE PM+C+N,D:NEXT N:POSITION ZZ-I,H:? W-T;" ":NEXT T
SC 1880 DATA 25,49,1536,255,25,49,1792,255,65,202,768,48,65,202,1536,255
JX 1890 DATA 115,142,1536,63,118,139,1536,0,23,24,1536,126,50,51,1792,126,23,24,1792,126,50,51,1536,126
CN 1900 DATA 222,224,1536,252,225,243,1536,132,244,246,1536,252,206,221,1792,255,203,205,1792,66
PW 1910 FOR N=34 TO 40 STEP I+I:POKE PM+768+N,6:NEXT N
OW 1920 FOR N=209 TO 217 STEP I+I:POKE PM+1792+N,129:NEXT N
DA 1930 FOR N=0 TO 7:READ D:POKE PM+1149+N,D:NEXT N:DATA 195,195,231,189,189,231,195,195
IY 1940 FOR N=0 TO 9:READ D:POKE 1736+N,D:NEXT N:DATA 0,0,60,126,255,255,126,60,0,0
ZK 1950 FOR N=1760 TO 1774:READ D:POKE N,D:NEXT N:DATA 230,7,162,0,160,0,200,208,253,232,224,4,208,246,96
IQ 1990 A=24:GOSUB Z:GOTO 5000
JG 1999 REM SET UP MAIN SCREEN
IO 2000 GRAPHICS 0:POKE 559,0:DL=PEEK(560)+256*PEEK(561):FOR N=53248 TO 53265:POKE N,0:NEXT N
XR 2010 FOR N=6 TO 25:POKE DL+N,4:NEXT N:RESTORE 2020:FOR N=I TO 10:READ D,DT:POKE DL+D,DT:NEXT N
ZT 2020 DATA 0,0,3,68,9,130,16,5,17,5,24,130,25,4,26,134,27,6,28,7
YT 2030 POKE 756,CHB:POKE 54279,PMB:S=240
CC 2040 RESTORE 2050:FOR N=1 TO 14:READ A,B:POKE A,B:NEXT N
VR 2050 DATA 82,0,708,118,709,184,710,20,711,0,53277,3,53260,53,1700,6,1705,0,1704,240,1,0,623,4,752,1,1771,4
KR 2149 REM DRAW BOARD
DT 2150 ? "K&$▸▸    &$de de de&$de de de&$";
YQ 2160 ? "###▸▸  /###(w-(w-(w###(w-(w-(w###";
KT 2170 ? "'%▸▸    '%de de de'%de de de'%";
QS 2180 ? "*)______________________*)____________*)____________*)";
PZ 2190 ? "  13 14 15 16 17 18 19 20 21 22 23 24"
RU 2200 ? "gfabcabcabcabcabcabcabcabcabcabcabcabno#";
BM 2210 ? "h tv su de su tv de tv de de de de tv p#";
BP 2220 ? "h tv su de su tv de tv de de de de tv p#";
UX 2230 ? "h tv su de de de de tv de de de de de p#";
DQ 2240 ? "h de de de de de de de de de de de de p#";
DT 2250 ? "h de de de de de de de de de de de de p#";
WU 2260 ? "h▸▸       ▸| ▸| ▸| ▸| ▸| ▸| "
TZ 2270 ? "h▸▸       ◂| ◂| ◂| ◂| ◂| ◂| "
EC 2280 ? "h de de de de de de de de de de de de p#";
EF 2290 ? "h de de de de de de de de de de de de p#";
SP 2300 ? "h su tv de de de de su de de de de de p#";
VW 2310 ? "h su tv de tv su de su de de de de su p#";
VZ 2320 ? "h su tv de tv su de su de de de de su p#";
WV 2330 ? "mlijkijkijkijkijkijkijkijkijkijkijkijrq#";
VO 2340 ? "  12 11 10 09 08 07 06 05 04 03 02 01"
AR 2350 ? "____________________________________________";
VO 2360 POSITION I+I+I,Z+I:? "000"
FC 2370 RESTORE 2380:FOR C=0 TO I:FOR B=0 TO 25:READ D:PG(B,C)=D:NEXT B:NEXT C
IJ 2380 DATA 0,2,0,0,0,0,3,0,2,0,0,0,3,0,3,0,2,0,0,0,0,0,0,0,0,0
OW 2390 DATA 0,0,0,0,0,0,0,0,0,2,0,3,0,3,0,0,0,2,0,3,0,0,0,0,2,0
AI 2400 BAR(0)=0:BAR(I)=0:MVS=0
ZR 2410 POKE 209,PMB+H:PLR=(PEEK(Z)>127)
KG 2420 POKE 712,250:POKE 512,0:POKE 513,PMB:POKE 559,62:A=USR(1536):POKE 54286,192
```

COMPUTER GAMMON continued

```
MH 2430 POKE 53762,48:POKE 1,I
CZ 2440 IF PEEK(I)<70 THEN 2440
SW 2450 POSITION 11,Z+I:? "trigger ":RETU
   RN
CU 4999 REM  COMMON INTRO/EXIT SCREEN 
DW 5000 GRAPHICS I:DL=PEEK(560)+256*PEEK(
   561):POKE 559,0:POKE 53277,0
FF 5010 RESTORE 5015:FOR N=704 TO 711:REA
   D D:POKE N,D:NEXT N
MO 5015 DATA 0,0,0,0,84,234,134,182
JK 5020 POSITION 3,5:? #6;"SU  h C  O  M
    P  U  T  E  R  p   SU"
OM 5022 POSITION 3,7:? #6;"SU   h   -----
   --------------   p   SU"
CW 5025 POSITION 3,9:? #6;"SU   h    G  A
    M  E  O  N   p   SU"
KL 5030 FOR N=53248 TO 53264:READ D:POKE
   N,D:NEXT N:POKE 623,4
RF 5040 DATA 10,42,190,220,0,0,0,0,3,3,3,
   3,0,255,255,255,255
GE 5050 FOR N=I TO 19:READ B,C:POKE DL+B,
   C:NEXT N:DATA 0,0,1,0,2,0,3,71,6,48,8,
   48,9,7,10,134,12,5,13,5,14,5,15,134
UJ 5060 DATA 16,48,19,48,23,48,25,71,28,1
   35,29,2,30,7
PE 5070 POKE 512,0:POKE 513,PMB+I
ID 5250 POKE 1,I:POKE 204,84
IW 5255 A=226*WIN:FOR N=704 TO 707:POKE N
   ,A:NEXT N:POKE 712,A:POKE PM+283,A:POK
   E PM+299,A
JX 5260 A=28:GOSUB Z:POKE 559,34:POKE 205
   ,H:A=USR(ADR("h d b \ "))
LP 5300 POKE 756,CHB:POKE 54286,192
AI 5900 IF WIN=I THEN 8000
AI 6000 POSITION 0,0:POKE 82,0:AUTO=I+I
RY 6010 ? #6;"          WELCOME"
EO 6015 ? #6;"            TO-"
OW 6020 ? #6;"           ATARI"
EV 6050 POSITION 0,13:? #6;"     BLUE PLA
   YER          ASCENDS  0-25"
YH 6060 ? #6:? #6;"     green  player
    descends -  "
HC 6070 NAME$="                    "
BO 6100 POKE 702,0:? "K      NAME OF  BL
   UE PLAYER    ENTER  ATARI  FOR SOL
   O VERSION          ";:INPUT N$
LJ 6105 NAME$(5-(LEN(N$)/2),10)=N$:IF N$=
   "atari" THEN AUTO=AUTO+I
VL 6106 IF N$="" THEN 6100
OS 6110 ? "K      name of green player
     ENTER  ATARI  FOR SOLO VERSION
           ";:INPUT N$
FO 6115 NAME$(15-(LEN(N$)/2),20)=N$:IF N$
   ="atari" THEN AUTO=AUTO+I+I
WK 6116 IF N$="" THEN 6110
VL 6120 POKE 702,64
MJ 6800 A=26:GOSUB Z:POKE 710,0:? "K":A=U
   SR(ADR("h d b \ ")):POKE 54286,64:G
   OSUB 2000
FG 6910 IF PEEK(Z)<15 THEN RESTORE (Z+I):
   POKE 182,19*RND(0):READ A:POKE 53762,A
UV 6920 IF STRIG(0) AND STRIG(I) THEN 691
   0
FD 6940 POSITION 11,Z+I:? "        "
HT 6950 A=24:GOSUB Z:GOTO 200
PH 7999 REM  END OF GAME 
DW 8000 POSITION 0,0:POKE 82,0:WIN=0:A=26
   :GOSUB Z
DD 8005 N$=NAME$(10*PLR+I,10*PLR+10):A=-3
   2
MB 8010 ? #6;"      ";:GOSUB 30:? #6;" "
UY 8015 ? #6;"          IS THE"
MG 8020 ? #6;"           WINNER"
IM 8025 K=PG(P3,PLR)-PG(P4,I-PLR):N$=STR$
   (K):A=-32
YA 8030 POSITION 0,13:? #6;"        ";:GOS
   UB 30:? #6;"  tile           advantag
   e "
PV 8035 N$=STR$(MVS):A=128
OX 8040 ? #6:? #6;"        ";:GOSUB ZZ:? #6
   ;" MOVES            WERE REQUIRED"
GN 8045 IF  NOT PLR THEN A=0:FOR N=I TO 2
   4:A=A+(PG(N,I-PLR))*((N<6)+(N>6)+(N>12
   )+(N>18)):NEXT N:A=A+BAR(I-PLR)*4
MC 8046 IF PLR THEN A=0:FOR N=24 TO I STE
   P -I:A=A+(PG(N,1-PLR))*((N>19)+(N<19)+
   (N<13)+(N<7)):NEXT N:A=A+BAR(I-PLR)*4
IZ 8050 ? "   SCORE   ";A*Z
SY 8060 ? "  PRESS  OPTION   TO CLEA
   R PROGRAM     start for new game";
TY 8070 A=26:GOSUB Z
FL 8080 IF PEEK(Z)<15 THEN RESTORE (Z+I):
   POKE 182,19*RND(0):READ A:POKE 53762,A
AL 8090 IF PEEK(53279)=6 THEN K=0:GOTO 84
   00
RU 8100 IF PEEK(53279)<6 THEN K=I:GOTO 84
   00
TZ 8110 GOTO 8080
XB 8400 A=USR(ADR("h d b \ ")):POKE 54
   286,64:POKE 53277,0:FOR N=53261 TO 532
   65:POKE N,0:NEXT N:POKE 82,I+I
VL 8410 IF K THEN GRAPHICS 0:CLR :END
NH 8420 RUN
XP 8500 FOR T=I TO Z+Z:NEXT T:RETURN
EV 9000 END
```

How to Type in the Listings

and get them right!

The program listings in PAGE 6 are prepared carefully to ensure that they can be typed in as easily as possible. Before typing any listings ensure that you are familiar with the use of the Shift and CONTROL and INVERSE keys as outlined in your computer manual. The listings are prepared to match exactly what you see on screen. Every character that you may see in a listing is included in the chart below for cross reference. By using TYPO 3 you can ensure that you type in the programs EXACTLY as they are printed. Remember a single typing mistake may mean a program will not run.

WHAT ARE THOSE CODES?

Each line of a program begins with a special two letter code. THESE SHOULD NOT BE TYPED IN. They are used by the program TYPO to check that you have typed each line correctly. IF YOU HAVE NOT ALREADY TYPED IN THE TYPO 3 LISTING PLEASE DO SO NOW. The program can be used as you type in each line of a program or to check an already typed program. The code for each line will match but if you have problems check the listing conventions below carefully, you are most probably typing a CONTROL character incorrectly. TYPO 3 cannot check if a line has been missed so if you have problems in running a listing count the lines in the program and ensure none are missing. If the TYPO codes match and the program still does not run, LIST it to cassette or disk using LIST "C:" or LIST "D:filename", switch off the computer, re-boot and then ENTER the program using ENTER "C:" or ENTER "D:filename". Save this version in the normal way.

HOW TO USE TYPO 3

1. Type in the listing carefully for although you can use TYPO 3 to check itself (see 6 below) it may not work if you have made mistakes.

2. SAVE or CSAVE a copy of the program.

3. Each time you want to type in a program listing RUN TYPO 3 *first*. The program will install a machine code routine in memory and then delete itself. Now type in a line as shown in the magazine *excluding the first two letter code* and press RETURN.

4. A two letter code will appear at the top left of your screen. If this code matches the one in the magazine carry on and type the next line. Note, the code will not match if you use abbreviations. If you prefer to use abbreviations LIST the line you have just typed, move the cursor to that line and press RETURN. The code should now match.

5. If the code does not match, use the editing keys to correct the line and press RETURN again. Repeat if necessary until the codes match.

6. To check a line you have already typed LIST the line, place the cursor on that line and press RETURN.

7. When you have finished a listing just SAVE or CSAVE it in the normal way.

You can type in a program without using TYPO 3 and then check it by SAVEing or CSAVEing a copy of the program, running TYPO 3 and then LOADing or CLOADing your program and proceeding as in step 6 above.

Always SAVE or CSAVE a program before running it and always use TYPO before telling us that a program will not run.

```
EI 1 REM ********************************
AL 2 REM *  TYPO III by Alec Benson     *
         *           June 1985          *
SA 3 REM * A proofreader for ANTIC and *
         *   PAGE 6 based on TYPO II    *
         * published by ANTIC magazine *
EL 4 REM ********************************
SG 100 GRAPHICS 0
WG 110 FOR I=1536 TO 1791:READ A:CK=CK+A:
   POKE I,A:NEXT I
CG 120 IF CK<>30765 THEN ? "Error in DATA
    statements - Check Typing":END
YM 130 A=USR(1536)
VT 140 ? :? "TYPO III is up and running":
   NEW
MA 1000 DATA 104,160,0,185,26,3,201,69
HG 1010 DATA 240,8,200,200,200,192,36,208
QB 1020 DATA 242,96,200,169,79,153,26,3
RK 1030 DATA 200,169,6,153,26,3,162,0
RR 1040 DATA 189,0,228,157,79,6,232,224
TO 1050 DATA 15,208,245,169,93,141,83,6
KC 1060 DATA 169,6,141,84,6,173,4,228
EU 1070 DATA 105,0,141,95,6,173,5,228
BK 1080 DATA 105,0,141,96,6,169,0,162
KK 1090 DATA 3,149,203,202,16,251,96,0
ZR 1100 DATA 0,0,0,0,0,0,0,0
LD 1110 DATA 0,0,0,0,0,0,32,94
JM 1120 DATA 6,8,72,201,155,240,55,230
TV 1130 DATA 203,133,209,138,72,169,0,133
TW 1140 DATA 208,162,8,10,38,208,6,209
MF 1150 DATA 144,7,24,101,203,144,2,230
RL 1160 DATA 208,202,208,239,133,207,24,1
   65
TM 1170 DATA 204,101,207,133,204,165,205,
   101
AW 1180 DATA 208,133,205,165,206,105,0,13
   3
XH 1190 DATA 206,104,170,104,40,96,138,72
NR 1200 DATA 152,72,162,0,134,207,134,208
GF 1210 DATA 160,24,6,204,38,205,38,206
EA 1220 DATA 38,207,38,208,56,165,207,233
TM 1230 DATA 164,170,165,208,233,2,144,4
SK 1240 DATA 134,207,133,208,136,208,227,
   162
CB 1250 DATA 8,165,207,133,204,165,208,6
XW 1260 DATA 204,42,201,26,144,4,233,26
MB 1270 DATA 230,204,202,208,242,133,205,
   169
BC 1280 DATA 128,145,88,200,192,40,208,24
   9
WV 1290 DATA 165,204,105,160,160,3,145,88
QA 1300 DATA 165,205,24,105,161,200,145,8
   8
MQ 1310 DATA 32,69,6,104,168,76,153,6
```

Lower case	Inverse lower	Upper case or Shift	Inverse Upper or Shift	CTRL	Inverse CTRL
1		!			
2		"			
3		#			
4		$			
5		%			
6		&			
7		'			
8		@			
9		(			
0		)			
<					
>					
a		A			
b		B			
c		C			
d		D			
e		E			
f		F			
g		G			
h		H			
i		I			
j		J			
k		K			
l		L			
m		M			
n		N			
o		O			
p		P			
q		Q			
r		R			
s		S			
t		T			
u		U			
v		V			
w		W			
x		X			
y		Y			
z		Z			
-		_			
=						
;		:			
+		\			
*		^			
,		[			
.		]			
/		?			

INVERSE SPACE

ESC ESC
ESC CTRL -
ESC CTRL =
ESC CTRL +
ESC CTRL *
ESC SHIFT CLEAR
ESC DELETE
ESC TAB
ESC SHIFT DELETE
ESC SHIFT INSERT
ESC CTRL TAB
ESC SHIFT TAB
ESC CTRL 2
ESC CTRL DELETE
ESC CTRL INSERT

CONTINUING GRAPHICS

Mark Hutchinson's regular column for beginners

This issue I will continue with a look at the Graphics modes but we will leave the text modes and have a quick look around the modes available for proper graphics.

As I explained in the last issue, all the modes are basically the same but they are utilised by the computer in different ways. Have a look at figure 1. This will show you each mode with its related colour, co-ordinates and memory size. This should be self explanatory, the only point of interest is GR.8 which has one plot colour, but has two luminances.

COLOR and SETCOLOR

These commands tend to cause a bit of confusion in the graphic modes so let's have a closer look at them.

SETCOLOR does not change screen colours directly but changes the colour stored in a certain COLOR register. There can be up to four of these COLOR registers used in each graphic mode (see figure 2). Colour can also be changed by POKEing the appropriate memory location. For instance, SETCOLOR 0,hue,luminance or its equivalent POKE 708,16*hue+luminance will do the same job. So, if hue = 4 and luminance = 10, you would use POKE 708,74. Figure 2 shows the SETCOLOR command and the equivalent memory location.

COLOR in a graphics mode will define the register to be used for drawing points; in a text mode it will give the ASCII character. For a four colour mode, such as GR.7, COLOR will be 0 for background colour and 1 to 3 for points. If the value is 4 then the real value for the register is set to 0 again, i.e. the value will cycle from 0 to 3 then start off at 0 again. In a two colour mode, such as GR.4, the values are 0 and 1 only. Above that the cycling begins.

GR.8 is a one colour mode so COLOR is used to set the luminance of the plotted point. The colour of this point will be the same as the background, and luminance will either show or hide the point.

To recap, COLOR 1, 2, 3 or 4 will display a point in a certain colour and SETCOLOR will change this colour. COLOR 0 will set the point colour to that of the background, effectively erasing the point. Figure 3 shows the modes and associated COLOR/SETCOLOR commands.

A DEMONSTRATION

To demonstrate the differences between all of the graphics modes, I wrote LISTING 2. This program will set up all of the modes and flip between each. I had hoped to write about page flipping during the summer but I was beaten to it by Allan Knopp in issue 25! As can be seen from figure 1, graphics 8 uses a massive amount of memory. This is because it uses very fine points (pixels or picture elements) to draw lines. Each point will have its value stored in RAM and this is termed a memory mapped screen. Because the screen is so finely drawn, a strange effect occurs known as artifacting. Listing 2 should should demonstrate this effect nicely.

GR. MODE	HORIZ COLMS	VERT ROWS	No.of COLRS	LINE TYPE	MEM SIZE
0	40	24	2	TEXT	993
1	20	24	5	TEXT	513
2	20	12	5	TEXT	261
3	40	24	4	PLOT	273
4	80	48	2	PLOT	537
5	80	48	4	PLOT	1017
6	160	96	2	PLOT	2025
7	160	96	4	PLOT	3945
8	320	192	1/2	PLOT	7900

Figure 1 – GRAPHICS MODES

If you find that the program will not run due to memory constraints, GRAPHICS 8 (lines 639 to 660 and line 1050) can be deleted and if necessary GRAPHICS 7 (lines 609 to 630 and line 1040). Remember to set counter G (line 710) to the appropriate value.

THANKS FOR WRITING

I would like to thank Brian Trevett for his kind letter. I am glad that I was able to be of such help. If any beginners need some advice that would take too long to explain here, I can be reached (with an SAE please) at the following **new address**.

1, HOLLYMOUNT,
ERINVALE, FINAGHY
BELFAST
BT10 0GL

Finally, a couple of tips from Mr. Robinson of Cumbria. You may know that LIST will display the complete listing of a program, but did you know that you can display a series of line numbers? LIST 100,120 will display all line numbers from 100 to 120 inclusive. This will also apply to a single line, eg. LIST 100.

When you use the TAB key to move the cursor across the screen, the default is 10. This is stored in location 201, so POKE any suitable number in here to change the TAB spacing. Hands up who knew that a comma causes tabbing. Try the following line to see what I mean.

```
PRINT "A","B",,"C"
```

See you next issue when we might take a look at animation.

SETCOLOR NUMBER	MEMORY LOCATION
0	708
1	709
2	710
3	711
4	712

Figure 2 – SETCOLOR EQUIVALENTS

MODE No.	SETCOLOR NUMBER	COLOR No.	USE
0	0	0-255	–
	1	GIVES	CHARACTER LUM
ALSO	2	CHAR-	BACKGROUND
TEXT	3	ACTER	–
WINDOWS	4		BORDER
1,2	0	0-255	CHARACTER
	1	GIVES	CHARACTER
TEXT	2	CHAR-	CHARACTER
MODES	3	ACTER	CHARACTER
	4		BACKGROUND, BORDER
3,5,7	0	1	POINT
	1	2	POINT
FOUR	2	3	POINT
COLOUR	3	–	–
MODES	4	0	BACKGROUND, BORDER
4,6	0	1	POINT
	1	–	–
TWO	2	–	–
COLOUR	3	–	–
MODES	4	0	BACKGROUND, BORDER
8	0	–	–
	1	1	POINT (LUM)
1 COLOUR	2	0	BACKGROUND
2 LUM.	3	–	–
	4	–	BORDER

The COLOR number defines the point to be used (with its associated SETCOLOR statement) in a graphics mode. In a text mode, COLOR defines the character to be plotted.

Where background is stated in graphic modes, any point using that colour number takes the background colour, effectively disappearing.

Mode 8 has one colour, that of the background, but has two luminances. One makes the point stand out, the other makes it disappear.

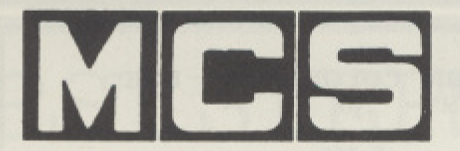
Figure 3

Listing 1

```
UO 489 REM *** Get Display List pointer.
VS 490 DL=560:DH=561:G=0
SF 499 REM *** Set up 1st. screen-GR.3.
UR 500 GRAPHICS 3:POKE 559,0:COLOR 1:PLOT
    0,0:DRAWTO 20,20:? "▸THIS IS GRAPHICS
    3"
IL 509 REM *** Protect screen by lowering
    RAMTOP. This is done for each screen.
FQ 510 DL3L=PEEK(560):DL3H=PEEK(561)
CE 519 REM *** Set up 2nd. screen-GR.4.
FM 520 POKE 106,PEEK(106)-4
CM 530 GRAPHICS 4:POKE 559,0:COLOR 1:PLOT
    0,0:DRAWTO 30,30:? "▸THIS IS GRAPHICS
    4"
GZ 540 DL4L=PEEK(560):DL4H=PEEK(561)
HT 549 REM *** Set up 3rd. screen-GR.5.
FS 550 POKE 106,PEEK(106)-4
GG 560 GRAPHICS 5:POKE 559,0:COLOR 1:PLOT
    0,0:DRAWTO 30,30:? "▸THIS IS GRAPHICS
    5"
II 570 DL5L=PEEK(560):DL5H=PEEK(561)
PC 579 REM *** Set up 4th. screen-GR.6.
JQ 580 POKE 106,PEEK(106)-8
SC 590 GRAPHICS 6:POKE 559,0:COLOR 1:PLOT
    0,0:DRAWTO 50,50:? "▸THIS IS GRAPHICS
    6"
IY 600 DL6L=PEEK(560):DL6H=PEEK(561)
Q5 609 REM *** Set up 5th. screen-GR.7.
CP 610 POKE 106,PEEK(106)-16
VD 620 GRAPHICS 7:POKE 559,0:COLOR 1:PLOT
    0,0:DRAWTO 50,50:? "▸THIS IS GRAPHICS
    7"
KH 630 DL7L=PEEK(560):DL7H=PEEK(561)
TB 639 REM *** Set up 6th. screen-GR.8.
AV 640 POKE 106,PEEK(106)-32
JY 650 GRAPHICS 8:POKE 559,0:COLOR 1:PLOT
    0,0:DRAWTO 100,100:? "▸THIS IS GRAPHI
    CS 8"
LQ 660 DL8L=PEEK(560):DL8H=PEEK(561)
UO 669 REM *** Set up intro screen.
HT 670 POKE 106,PEEK(106)-48
QZ 680 GRAPHICS 0:POKE 559,34:POKE 712,32
    :POKE 710,114:POKE 106,PEEK(106)-4
ZI 690 POKE 752,1:? "↓↓▸PRESS ANY KEY TO
    CYCLE.":POKE 764,255
TB 699 REM *** Go to next screen if a key
    is pressed.
DU 700 IF PEEK(764)=255 THEN 700
QT 710 IF G>5 THEN G=0
CA 720 GOSUB 1000+10*G
ZC 730 G=G+1:GOTO 690
IY 999 REM *** Subroutine to reset the DL
    pointer for the next screen.
GP 1000 POKE DL,DL3L:POKE DH,DL3H:RETURN
IL 1010 POKE DL,DL4L:POKE DH,DL4H:RETURN
KH 1020 POKE DL,DL5L:POKE DH,DL5H:RETURN
MD 1030 POKE DL,DL6L:POKE DH,DL6H:RETURN
NZ 1040 POKE DL,DL7L:POKE DH,DL7H:RETURN
PV 1050 POKE DL,DL8L:POKE DH,DL8H:RETURN
```

Listing 2

```
FY 119 REM *** ARTIFACTING IN GRAPHICS 8.
5B 120 GRAPHICS 0:POKE 710,48:POKE 712,18
    :POKE 752,1
BF 125 ? "↓▸The television screen is made
     up of thousands of tiny coloured poin
    ts  that show up when hit by the";
SI 130 ? " TV beam. These points are not
    in straight linesbut are slightly offs
    et to each other."
UE 150 ? "▸When lines are drawn in mode 8
    , this offset can be taken into accou
    nt to produce";
HR 155 ? " extra colours. These extra col
    ours are produced by the technique kno
    wn as ARTIFACTING."
UA 160 ? "▸These points are coloured GREE
    N, RED, and BLUE, and when the lines a
    re drawn they will look like this."
TF 170 ? "▸▸↓↓R G B R G B":? "▸▸↓B R G B
    R G":? "▸▸R G B R G B":? "▸▸↓B R G B R
     G":? "▸▸R G B R G B"
UD 200 POKE 764,255:POSITION 8,23:? "PRES
    S ANY KEY TO CONTINUE"
ZO 210 IF PEEK(764)=255 THEN 210
AT 220 POSITION 6,16:? "▸▸R G B R G B":?
    "▸▸↓B R G B R G":? "▸▸R G B R G B":? "
    ▸▸↓B R G B R G":? "▸▸R G B R G B"
XN 230 POKE 764,255:POSITION 8,22:? "PRES
    S ANY KEY TO CONTINUE"
DA 240 IF PEEK(764)=255 THEN 240
FL 300 GRAPHICS 8:POKE 710,0:POKE 712,20:
    COLOR 1:FOR X=0 TO 319 STEP 3:PLOT X,4
    0:DRAWTO X,130:NEXT X
XR 309 REM *** ARTIFACT.1
IZ 310 POKE 752,1:? "▸▸↓↓ARTIFACTING":FOR
     T=1 TO 800:NEXT T
YP 319 REM *** ARTIFACT.2
FW 320 GRAPHICS 8:POKE 710,0:POKE 712,20:
    COLOR 1:FOR Y=0 TO 191 STEP 3:PLOT 160
    ,0:DRAWTO 319,Y:NEXT Y
YM 330 COLOR 1:FOR X=319 TO 0 STEP -3:PLO
    T 160,0:DRAWTO X,191:NEXT X
VE 340 COLOR 1:FOR Y=191 TO 0 STEP -3:PLO
    T 160,0:DRAWTO 0,Y:NEXT Y:POKE 752,1:?
     "▸↓↓↓MORE ARTIFACTING"
OP 350 GOTO 350
```



MIKES COMPUTER STORE

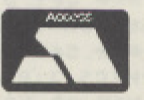
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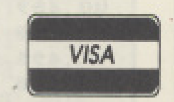
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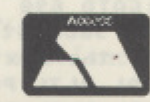
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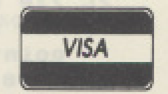
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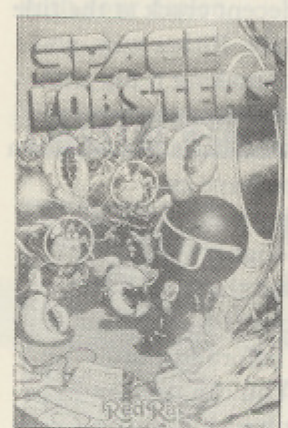
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SHORT REVIEWS

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Firstly, a brief amendment to last issue's review of ESCAPE FROM DOOMWORLD. Unfortunately, there was a price mix-up and it appears that this program is, in fact, a budget release. It retails at £3.95 on cassette and £5.95 on disk. Can't think of a better reason to rush out and buy it, can you?

SPACE LOBSTERS



Red Rat
64K cassette
£7.95
64K disk
£9.95
1 player
1 joystick/ keyboard

I received SPACE LOBSTERS as a pre-release but it should be available by the time you read this. It's an arcade adventure set inside the huge colony-ship, Colossus, which has been drifting in space for eons as a result of the continuing war between Mankind and the Space Lobsters. Captain Crumble – latest product of Red Rat's active imagination – has the unenviable task of salvaging the ship and returning it to Earth. Is there a fearsome Space Lobster on board? Could be. What poor old Crumble doesn't realise is that it's a female of the species now reaching the completion of her spawning cycle. The corridors of the Colossus are swarming with hundreds of Robo-Droids and newly-hatched Space Lobsters and, guess what?...... human flesh is their favourite diet!!!

The screen layout is similar to those Mastertronic games such as Red Max and Last V8, with the bottom two-thirds taken up by an expertly designed control-panel, displaying all relevant information in a clear and recognisable manner. Gameplay is therefore restricted to the top third of the screen but, unlike some other games built along this design, the restricted layout isn't a problem in SPACE LOBSTERS. The screen scrolls in a left/right horizontal direction (not strictly true as each new location replaces the previous one when Crumble moves off-screen – there is no actual scrolling) as you travel through the ship and there is no vertical movement to magnify the limitations of the screen size.

The metallic walls of the ship are similar to the graphics used in 'BRASS' and countless other Atari magazine and disk demos, and is really effective. The scenery changes colour as you move from one corridor area to another.

The game characters are, of necessity, small but highly detailed and most are in more than one colour, contradicting the idea that you can only have single-colour PMG's on the Atari. Great animation too and it's worth losing a life just to see Crumble sprout wings and fly off into oblivion, or heaven depending on which is nearest!

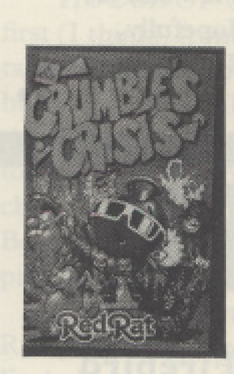
Captain Crumble is equipped with a plasma-blaster to fend off all the nasties but has only limited ammunition. Extra firepower is obtained by logging on at one of the many computer terminals and trading off score points for further supplies. Ten hidden codes are waiting to be discovered at the terminals which ultimately give Crumble access to the escape pod. I'm not quite sure how this ties in with salvaging the ship, but that's hardly important. Incidentally, when Crumble logs on at a computer terminal all actions open to him are displayed on the control-panel. A simple keypress activates your choice.

Teleporter Booths are waiting to transport Captain Crumble to other corridor levels and, all told, there are 150 screens for him to explore. It's heavy going though. On top of all the aliens streaming in from both sides, Crumble has to duck periodically to avoid Flying-Droids. A real menace these as he cannot duck and fire at the same time and often gets suckered by an incoming Robo-Droid whilst still in a ducking position. Four lives do not go far in this game!

Red Rat often include fancy hi-res title screens in their games but these usually go unnoticed. This one won't. It's a riotous cartoon style comic-strip of Crumble and his cast of aliens and is totally amazing. That goes for the theme music too. Composed by Richard Munns, it proves that Rob Hubbard is not the only musical genius in Atari circles these days.

In the past, Red Rat have produced software of reasonably good value. Now they have suddenly upped their quality level and Atari owners everywhere are poised to reap the benefits. Good on you, Red Rat...... SPACE LOBSTERS is a real beaut!

CRUMBLE'S CRISIS



Red Rat
XL/XE only
64K cassette
£7.95
64K disk
£9.95
1 player
1 joystick

The first, it appears, in a new range of arcade adventures featuring mega-hero, Captain Crumble. This time dozens of alien Fuzzies (30 to be exact) have escaped from the Intergalactic Zoo and Crumble has to travel through the 5 levels of the multi-verse to find and snare the Fuzzies in containment cages.

It's a game which shares many similarities with Starquake but with enough fresh ideas to make it sufficiently different. Crumble is equipped with a back-pack Hovver Unit to enable him to move quickly around the caverns of the multi-verse. He must avoid touching most of the walls (composite anti-matter...... very deadly!) but there are 'safe' areas which are okay to walk on.

Ghosts, Goblins and Evil Weevals all attempt to hinder his progress and drain his energy packs and these become more obnoxious as you advance through the five zones. It's also wise to keep moving or Time-Lightning will strike at your energy packs and drain them with remarkable speed. Luckily, extra energy can be obtained by collecting suitable items scattered around the multi-verse.

The Fuzzies have a sick sense of humour and have hidden themselves in the most dangerous locations imaginable. Rounding them up could prove to be quite an achievement. There are certain tricks you must learn to help you negotiate the zones but, if all else fails, there is a practice option available after level one to help you test out your ideas.

CRUMBLE'S CRISIS is an absolute corker and Crumble himself the most instantly appealing character to hit the Atari since Jet Boot Jack. Graphics, sound, animation and gameplay are truly astounding and, once again, the game features a stunning comic title screen and accompanying music from that man Richard Munns. I must thank Red Rat for the special review copy which allowed me to view and play the 5 different zones. Each zone has it's own unique and complex design (Zone 4 – 'Moon World' – is my own particular favourite) and the graphical content has to be seen to be believed. Just wait till you get a glimpse of the flapping telephones and snapjaw scissors!

Classic games are few and far between these days. Hopefully, CRUMBLE'S CRISIS will change all that. Brilliant!! •

FIGHT NIGHT



Sydney/ US Gold
48K disk
£14.95
1/2 players
1/2 joysticks

I hinted in a previous issue that Boxing was one of my least favourite sports, but anything which adds a touch of comedy to this senseless act of 'brain damage' is worth investigating in my book.

FIGHT NIGHT is a multi-featured sports simulation boasting a cast of characters which puts many a TV comedy show to shame. Can you tackle the likes of the DIP STICK, who makes 'Mr Puniverse' look like Charles Atlas...... KID KASTRO, the cigar-smoking hombre from Cuba...... HU HIM, brother of Odd-Job and twice as nasty not to mention ugly...... the BRITISH BULLDOG, that bowler-hatted, stiff upper-lipped ex-Dean of Oxford...... and the BRONX BOMBER, eighteen stone with a two ounce brain, Champion of the World? Yes, can you tackle this bunch of pugilistic misfits without bursting into fits of hysterics? Me neither!!

The game takes up two full disk sides and offers a range of training, sparring and fight options which even includes the ability to construct your own custom-built hit-man (FIGHT NIGHT boxers come made-to-measure as well as off the peg) using the many parameters and fighting characteristics included in the program. This way you can build up to 24 custom boxers for tournament purposes or create a personalised fighter capable of taking on the world's elite. Mind you, the reality isn't quite so simple. My custom-built 'Bonecrusher' tended to fight more like Joe 'The Punchbag' Bugner against even the wimpiest of opponents! It makes sense to get some hefty training & sparring under your belt before braving the might of the professionals.

The main event requires you to fight your way through the five major contenders with a view to taking on the formidable BRONX BOMBER. Alternatively, you can opt for a manager's role, setting up promotions and suitable fight selections which will get your fighter a decent crack at the title in Tournament Mode. Either way, you have little chance of making it big with your normal 'default' boxer and constructing a custom-built 'Rocky' is an absolute must if you have any championship aspirations.

Each bout is fought over three 3-minute rounds and the idea is to out-slog your opponent by draining his 'KO' strength bar before he does likewise to yours. You can win the fight either by a straight knock-out or a points decision, depending on your punching power. The graphics are spot on, the characters big and life-like with plenty of extra detail. Each bout also contains a close-up 'mug shot' of the two competitors displayed in all their glory above the ring as if on some giant monitor screen, giving you some idea of how ridiculous they'd look on a passport!!

As with most other boxing games it's a Heavyweight slogging match – no fancy footwork involved, just a left and right flat-footed shuffle back and forth across the ring – and tactics are limited to jabs, bodyblows and throwing up a guard to prevent you from getting a nose like Karl Malden, but then what else is new in boxing?

Each of the characters have their own personal style of fighting, their own strengths and weaknesses (apart from the BRONX BOMBER who has no weaknesses), and their own 'secret weapon' which they unleash whenever they are in deep trouble. HU HIM, for instance, lashes out with a karate kick which wouldn't impress the W.B.A. (No, not West Bromwich Albion....... World Boxing Authority. Or is it Association?) but is, apparently, perfectly acceptable in

CAVERNS OF ERIBAN



Firebird
£1.99 cassette only
1 player
1 joystick

Yet another new release in Firebird's 'Silver 199' budget range. CAVERNS OF ERIBAN is a game with some sort of logical method to it instead of the usual 'zap & blast' stuff.

As pilot of a mine supply ship it's your job to pick up surface supplies from the main depot and deliver them to various mining depots situated deep in the underground caverns of the planet Eriban. You are limited to carrying 5 supply pods at a time and, once they've been dropped off, it's back to the surface for refueling and more supplies.

Nothing to it, eh? No such luck. The caverns are protected by ancient defence mechanisms and the old trigger finger will be put to the test at every turn. And have you tried to manoeuvre a spaceship through the tight caverns and chambers of Eriban? No, I bet you haven't. Imagine trying to pilot Concorde through the Wookey Hole and you'll get some idea of what's required!

This game reminds me of THRUST in many respects, but the additional elements give it lots more depth and certainly more long lasting appeal. One more thing – if you bought THRUST and couldn't handle the keyboard only input, you'll be pleased to learn that ERIBAN features full joystick control.

Not in the same league as WAR HAWK maybe but still cheap at twice the price. More please Firebird! •

FIGHT NIGHT. KID KASTRO has his 'Castinet Crusher' and the BRITISH BULLDOG his 'British Rail Roundhouse', but old Banjo Eyes himself – the DIP STICK – possesses the most diabolical secret weapon of the lot. If you drive him into a corner against the ropes he launches into a weird sort of contortion and strikes at you with his 'sucker punch' disguised as a convulsion. Even though you know it's coming it still seems to get you every single time!

Another quality product from US Gold which includes just about everything you could possibly wish for, right down to the clever documentation complete with it's hilarious send-up of the five main contenders. FIGHT NIGHT puts the fun into boxing where it never existed before. Worth every penny of the asking price.

NB: The instructions mention a cassette version but whether this applies to the Atari or not is anyone's guess. Best check with your dealer.

CHICKEN CHASE



Bug Byte
£2.99
cassette only
1 player
1 joystick

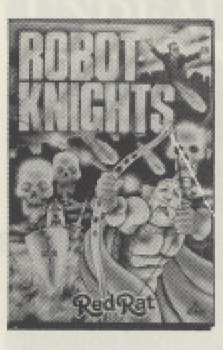
Bug Byte have a habit of releasing old Atari games, so I'm not quite sure whether this fits into that category or not. I'll give it the benefit of the doubt seeing as I've never heard of it before.

It's egg-hatching time in the henhouse and your job as 'Super Rooster' is to protect the eggs from marauding rats and hedgehogs. You then wait for the eggs to hatch, usher the young chicks to safety, and Bob's your auntie!

If only it was that simple. Yes, a Rooster's life is not a happy one and you must find time between chores to gobble worms and grain in order to keep your strength up. And pity help you if you make a hash of things cause that's when the 'missus' puts in an appearance and belts you over the head with a rolling pin. It gives a whole new meaning to the word 'henpecked'!!

CHICKEN CHASE is a nice simple, uncomplicated, game with reasonable sound and graphics plus a sense of humour. It's in machine code too which is a step in the right direction for Bug Byte. Worth looking at.

ROBOT KNIGHTS



Red Rat
48k disk
48k cassette
1/2 players
1/2 joysticks

Mad genius Evil Otto, a sort of 25th Century Dr. Frankenstein, escapes from Futureworld into the past. Your Robot Knights follow him and must find his laboratory and destroy the monster he has created before time runs out. You'll have to fight off the Guardian Zombies who will attack you with fireballs as you progress through all the dungeons & chambers of Castle Klang........ This sets the scene for ROBOT KNIGHTS, another new release this month from Red Rat.

It's a platform game with an added adventure theme to add some originality and features single player gameplay or a 2-player combined option. In single player mode you control SIR BRAVE (or SIR BOLD if you prefer), a Knight of great distinction, who is equipped with a handy Deflector-Shield. This is used to fend off fireballs and plasma-globes which are launched at you by Otto's guardian creatures. Zombies are the most common. These pitiful creatures are the result of Otto's failed experiments on the peasant villagers of the area.

You begin the game with only one life and 1000 energy units. You lose energy by contacting a fireball, plasma-globe, zombie or other creature, or by falling off a platform above head height. You gain extra energy by collecting energy sources which are found in some rooms of the castle. Lose all your energy and you lose your head...... literally!!

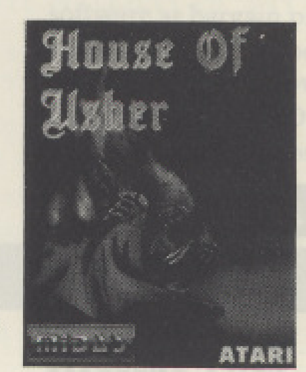
There are nine different rooms to negotiate – Dungeons I & II, the Secret Passage, the Lost Cavern, the Store Room, the Great Hall, Otto's Room, the Transformer Room and, finally, the Laboratory. Each room has to be cleared of all it's items and inhabitants before the door opens to allow you through to the next one. You repeat the process in subsequent rooms until you reach the laboratory where Otto is located. Destroy him before the monster destroys you!

In 2-player mode, the second player controls SIR BOLD who is armed with an Energy-Bow. You can fight each other or, more sensibly, combine your resources against Otto and his creatures. The 2-player mode is a lot of fun and gives you double the chance of advancing through the dungeon levels.

ROBOT KNIGHTS rates just below the two 'Crumble' games but is still a cut above most of the recent releases. The graphics are big and bold, the screens well designed, and gameplay at a suitable level of difficulty for most people to cope with (I used play level three as the other two are a bit 'slow motion' for my taste). Oh yes, and the high-score table with it's Olde English text is a nice touch and compliments the 13th Century game setting.

If Red Rat maintain this standard, each new release will command the same attention as those early Synapse games. Who said the 8-bit was dead?

HOUSE OF USHER



Midas/ Kingsoft
48K cassette
1 player
1 joystick

HOUSE OF USHER is an Atari first (I think!) from Midas Software and takes it's name from that infamous tale of horror by Edgar Allen Poe.

It's a platform game vaguely similar to Miner 2049er and, indeed, the main character looks a lot like our old friend Bounty Bob dressed up in a pixie-suit (A pixie suit?...... oh well, it takes all sorts!!).

Pixie Bob starts off in a vast Reception Hall containing nine doors. Each door gives him access to a further nine rooms and the idea is to work your way through these rooms, negotiating the various hazards involved to complete the overall puzzle and, eventually, escape into the sanity of the outside world.

The 'fiendish challenges' devised by the 'twisted minds of deranged madmen' are all pretty routine stuff and you won't find anything you haven't encountered before in many other games of this type. In fact, the biggest challenge involves trying to get Pixie Bob safely off the top of a ladder without sliding all the way down to his doom. It appears to be a 'bug' in the program, but if it's included by design then I'm definitely not amused!

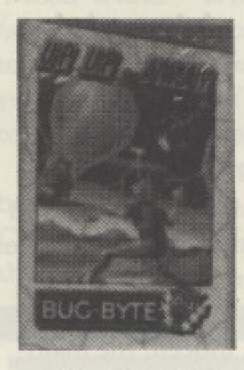
The graphics are fairly simple (ladders & levels set against a familiar

black background), the sound effects reasonable enough for this type of game, and the theme music tuneful if somewhat repetitive – it sounds like a scrambled version of 'Jingle Bells' to my ears, but if someone decides it's 'Prelude in B Minor from Mendelhoven's Unfinished Chorale Symphony' then it'll do for me!!

A couple of points worth noting. The cassette inlay features a hi-res screenshot of an eerie, moonlit House Of Usher, but it's not part of the Atari version as far as I know. Pity that. Also, the instructions advise you to 'CLOAD' the cassette hinting that it's a Basic program. Midas are doing the game a great injustice here with what amounts to a major 'misprint'. Please ignore it as the game is an auto-boot, 100% machine-code game.

No prices accompanied the review copy. As a budget game(?) it's a good effort. Not in the same class as Firebird and Mastertronic's best but it's early days yet. Check it out. •

UP, UP & AWAY



Bug Byte
£2.99 cassette only
1 player
1 joystick

Bug Byte have resurrected another 'Golden Oldie' from Starcade which dates from 1983 when it was a product of Ringblack Software. You control a hot-air balloon travelling sedately across a scrolling countryside. Your journey is a precarious one and lightning, wayward kites, downdrafts from windmills and updrafts from factory chimneys will keep you on your toes. A crash course in elementary ballooning is recommended!

And then you have to contend with delinquent Leeds Utd. fans (are there any other kind?) throwing stones at you, crazy aeroplane pilots who obviously trained with the 'Gary Numan School of Safe Flying', and also mischevious birds who seem to be...... no they can't be doing that, can they? They wouldn't dare!

Extra fuel is gained by landing at strategic stopping places along your route and, if you survive long enough to reach your starting point again, the game advances to the next level of play. There are several such levels of increasing difficulty.

The only thing which ruined the original version was the theme music – a slow, painful rendition of 'Would you like to fly in my beautiful balloon?' – but it's missing from this re-release. I guess Starcade didn't like it either!

A delightful program with charming cartoon style graphics and it is also one of the few non-violent games around – not a zap in sight. Go on, spoil yourself. It's worth three quid surely? •

SPIKY HAROLD



Firebird
£1.99
48K cassette only
1 player
1 joystick

A hedgehog is not the most exotic creature to base a computer game on. The Welsh turn them into crisps and lorry drivers turn them into 'hedgehog sandwiches', but Firebird have decided to turn them – or one of them at least – into a computer hero. Surprisingly enough Harold turns out to be quite a cute little dude.

You must help our spiky friend to prepare for hibernation by guiding him through the 57 chambers beneath the hedgerow in search of food. Various creepie-crawlies must be avoided, as well as conkers, sulphur clouds, bouncing balls and peeping periscopes (eh?).

The graphics are fresh and lively with an uncommonly sensible use of colour – all lethal objects are coloured brilliant white to distinguish them from the background scenery, food, and other 'safe' objects. The screens are re-drawn quickly and neatly as Harold moves from one location to the next and the animation is tidy and flicker-free as it always should be on the Atari. The realistic movement of the flying wasps warrants a mention as it is particularly impressive. In fact, the overall quality of the program is astounding and I can't understand how they do it at these prices. I'm not complaining though!

Progressing through each location requires perfect timing and a great deal of patience (keep a swear-box handy). Definitely for the connoisseurs this one and the degree of difficulty is such that a hefty 30 lives are allotted at the start of every game and further lives are gained by collecting coins which can be found in random locations. Harold can also collect wine glasses which make him drunk. This has the effect of reversing the joystick control for a short while. Even so, progress is painfully slow at the best of times.

Firebird have gone back to their roots with an enjoyable game in the style of their early efforts which pioneered their 'budget' label. WARHAWK put them on top of the Atari budget league. SPIKY HAROLD will ensure that they stay there. •

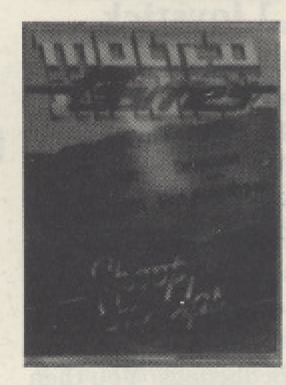
MOLECULE MAN

Mastertronic
£2.99 cassette
1 player
1 joystick/keyboard

This is one of those 3-D maze arcade adventures initially made famous by Ultimate on the Spectrum when they pioneered this style of game with hits like ALIEN 8. Firebird recently introduced Atari owners to this format with a cute little number entitled 'Chimera' and this

[redacted]

SHOOT 'EM UPS



Various/ US Gold
2 cassettes £9.95
disk £14.95
1/2 players
1/2 joysticks

SHOOT 'EM UPS is the title of the latest 4 game compilation from US Gold, but it might well have been called 'The Good, The Bad & The Ugly' for it is a pretty mixed batch quality-wise.

First the good, and they don't come any better than **DROPZONE**. Super sound, dazzling rainbow colour graphics, slick animation and warpspeed scrolling combine to make this DEFENDER clone a mega-game in every sense of the word. It's worth loading this one just to view the title screen and high score table which are better than most GAMES currently on the market!

DROPZONE proves once and for all that the graphic capabilities of Atari 8-bit computers are second to none (the Crappydore version doesn't come close).

game runs along much the same lines.

MOLECULE MAN – a sort of golf ball on legs – is lost in an enormous maze of 256 different locations. Time and radiation are against him and you must guide him to safety via a teleporter. Trouble is 16 circuits are required to operate the teleporter and these must be found and collected first.

Cash is the key to everything. Find a coin and you can buy time, life pills or bombs which will destroy parts of the maze normally impassable. You begin with only twenty seconds on the clock to find your first coin and, so far, I've tried every which way but loose but I've never come across one yet! I'd appreciate some help here!

The graphics are largely in black and white due to using the highest resolution mode available. The maze artwork is astounding with plenty of intricate detail thanks mainly, I suspect, to the genius of S.A. Riding who is responsible for the Atari version. Am I right in assuming this is the same S.A. Riding who programmed 'Airstrike' for English Software?

MOLECULE MAN is a 'toughie' which should keep determined gamesters happy during the long winter months. ●

DOMAIN OF THE UNDEAD



Red Rat
£9.95 disk
£7.95 cassette
1 player
1 joystick

Spectres and Ghouls and things which go bump in the night .... well, mostly skeletons really. Red Rat have delved into the mystical world of the Evil Dead to bring us this new one.

Your primary aim is to collect something called the 'Master Key', though exactly why it doesn't say. Being a brave sort of chap (or ever-so-slightly insane) you decide to go for a midnight stroll through the graveyard. Oh yes, and there's a full moon of course!

Skeletons rise up, literally, from their graves and attack you on all sides. And the vampire bat perched on top of that tombstone isn't there for decoration either. Get within striking range and it swoops down on you like an airborne Count Dracula. A clove of garlic would come in really handy here!

You can ward off the evil forces with your Anti-Spectre Bolt (gun, in other words) but, like all fully paid-up members of the Walking Dead, they refuse to lie down and attack you with renewed vigour. Traps spring up all over the place hoping to catch you unawares, and Red Rat promise Lightning, Devils Tridents, Gargoyles and various other Winged Creatures in the later stages but I've never survived long enough to encounter them. I'm not sure I want to either!

All this Hammer-style drama sets the game up as a scene from 'Zombie Flesheaters' or similar, but it's basically a left to right, blast everything in sight, scrolling job. Not a bad little game by any means – the musical effects are excellent. However, with Firebird and Mastertronic producing top quality software at bargain prices, full price software has to be special to justify the extra cash. I somehow feel DOMAIN OF THE UNDEAD would have been better suited to the budget end of the market. ●

An undoubted classic – possibly the best Atari game ever. If you don't have it in your collection then you don't have a collection. It's as simple as that.

Also in the 'Good' category is **FORT APOCALYPSE**. Quite popular with the compilation brigade as it also figures in English Software's latest 'Hits' release. In a cross between Choplifter and Scramble you must brave the Kralthan defenses and fly your jet-copter into the depths of the dreaded Fort Apocalypse to rescue all the prisoners held captive there. Enemy robocopters, tanks, SPM's and missile drones are easily dealt with (easily?!?), but the hyper chambers and RFE shafts are a different kettle of jellied eels (or even fish). They bring a strategic element to the game and you'll soon realise that this isn't just a game of brute force and ignorance. Just one of the many superior programs which made Synapse the premier Atari software company only a few short years ago. Whatever happened to them, I wonder?

Bad is an apt way to describe Sega's **SUPER ZAXXON**. As a follow-up to the enormously popular ZAXXON it took the Zaxxon theme to new heights in the arcades, but the Atari version is poor in comparison with the original. Both games feature scrolling action in simulated 3-D as you guide your spaceship against the might of the awesome Zaxxon space fortress. In SUPER ZAXXON the robot guarding the second and final fortress has been replaced by a dragon (no mother-in-law jokes please!), which requires six hits in it's gaping mouth to destroy it. Sadly all the other changes are not for the better. The graphics in SUPER ZAXXON have been condensed so that everything appears on a much smaller scale. It's a big strain on the eyesight and the realistic effect of the ship tilting and diving over the fortress is all but lost. The colours are real dullsville but, worse than that even, the Atari version is inferior to certain other computer versions of the game. Sacrilege!! The next time Sega release a decent Atari game it will be their first since the original Zaxxon.

Finally it's the ugly one. **BLUE MAX 2001** was a very belated follow-up to the classic BLUE MAX, a 3-D World War I bi-plane shoot 'em up which borrowed the basic Zaxxon idea and then improved on it a thousandfold. If Synapse released a better game I've yet to see it. Perhaps too much was expected of it's successor? Anyway, it turned out a disappointment.

The action is set in the year 2001 with Max Chatsworth IX, direct descendant of the legendary 'Blue Max', piloting an octagonal polo-mint (if you want to call it a space-age hovership that's your business .... it looks like an octagonal polo-mint to me!) against the evil Furxx empire who have taken over the earthbase, Gamma IV.

Control of the polo-mint is via the diagonals, making it a nightmare to fly, far less operate the bombs and lasers, with any degree of accuracy. If you fancy shooting down a few enemy spacecraft, forget it. It's easier to get a laugh out of Ted Rogers on 3-2-1!!

BLUE MAX 2001 was almost the last game released by Synapse. What a pity they couldn't finish on a higher note.

Compilations like this are a great idea as they help introduce new Atari owners to some of the older games they may have missed out on. If US Gold had substituted SUPER ZAXXON and BLUE MAX 2001 with their original counterparts (ZAXXON and BLUE MAX) this package would have been unbeatable. ●

ANTS IN YOUR PANTS

by Allan Knopp

Benny is being attacked by a horde of marauding ants intent on invading his Bermuda shorts! His only defence is to stamp on them, but he is fighting a losing battle. It is only a matter of time before he is overcome by sheer weight of numbers and suffers the ultimate indignity. How long can he hold out?

Ants In Your Pants makes use of page flipping for the movement of Benny's legs. His legs are controlled with a joystick and there are seven different leg positions, each position stored on a different screen. The movement is achieved by displaying screens according to the position of the joystick. If you read my article on page flipping in Page 6 issue 25 you should be able to follow the program, the initialization is very similar to 'Bouncing Bert'.

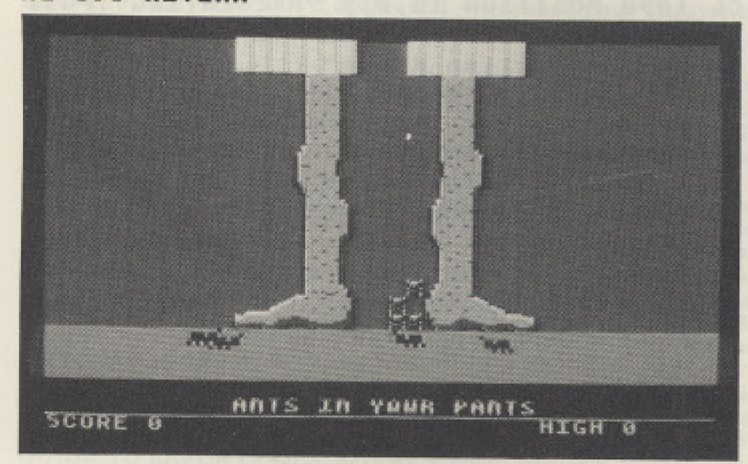
Player missile graphics are used for the ants because they are independent of page flipping. The screen colours for sky, grass and the flashing title line are implemented using a display list interrupt created with DLI Maker, which was published in Analog No.38.

If you have trouble typing in the control characters in lines 840 to 850 then listing 2 will create them for you. Be sure to save the program before you run it because it will delete itself from memory, just leaving the required lines. After running you should be left with just lines 840, 845 and 850. LIST those lines to cassette or disk then ENTER them into the main program. I have included a checksum which should catch any errors in the DATA statements.

Can you stop the ants invading Benny's bermudas?

```
EI 1 REM ******************************
ND 2 REM *      ANTS IN YOUR PANTS      *
RQ 3 REM *             by               *
IS 4 REM *        ALLAN KNOPP           *
TC 5 REM *                              *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ******************************
NO 9 REM
MY 100 GOTO 1080
WQ 105 RAMTOP=PEEK(106)
VC 110 GOSUB 1045
HP 115 TX=4
MD 120 GOSUB 355:GOSUB 400
RD 125 GOSUB 355:GOSUB 405
NB 130 GOSUB 355:GOSUB 410
SB 135 GOSUB 355:GOSUB 415
NZ 140 GOSUB 355:GOSUB 420
SZ 145 GOSUB 355:GOSUB 425
OX 150 GOSUB 355:GOSUB 430
AM 155 POSITION 12,22:? " PLEASE WAIT "
DJ 160 POKE 257,182:POKE 258,120:POKE 259
   ,40:POKE 260,6:REM * DLICOLOURS *
JQ 165 POKE 708,36:POKE 709,24:POKE 711,1
   4:POKE 710,74
JT 170 POKE 752,1
SJ 175 GOSUB 835:GOSUB 810
YU 180 GOSUB 525:GOSUB 865
VS 185 Z=4.5:GOSUB 445
DX 190 POSITION 12,22:? "             "
EM 195 POKE 756,CHI
YJ 200 Y=85:XC=200:XD=200
NL 205 REM * MAIN LOOP *
EJ 210 ST=STICK(0):STR=STRIG(0)
AD 215 IF ST=15 AND SO=1 THEN POKE DL+5,R
   AMTOP-28:SO=0:SOO=0
WD 220 IF ST=6 THEN POKE DL+5,RAMTOP-4:GO
   SUB 300
BR 225 IF ST=5 THEN POKE DL+5,RAMTOP-8:GO
   SUB 300
HS 230 IF ST=7 THEN POKE DL+5,RAMTOP-12:G
   OSUB 300
PJ 235 IF ST=11 THEN POKE DL+5,RAMTOP-16:
   GOSUB 300
HF 240 IF ST=9 THEN POKE DL+5,RAMTOP-20:G
   OSUB 300
NN 245 IF ST=10 THEN POKE DL+5,RAMTOP-24:
   GOSUB 300
UV 250 POKE 53278,1
BI 255 IF PEEK(53255) OR PEEK(53253) OR P
   EEK(53254) OR PEEK(53252) THEN GOSUB 4
   75
XI 260 XA=XA+XAA:XB=XB+XBB:XC=XC-XCC:XD=X
   D-XDD
XR 265 IF XA>124 THEN XA=40:GOSUB 455
YI 270 IF XB>124 THEN XB=40:GOSUB 455
ZR 275 IF XC<128 THEN XC=208:GOSUB 455
AI 280 IF XD<128 THEN XD=208:GOSUB 455
VN 285 GOSUB 315
MU 290 GOTO 210
MV 295 REM * STOMPING SOUND *
GM 300 IF SOO<>0 THEN RETURN
NE 305 FOR X=16 TO 0 STEP -2:SOUND 0,200-
   10*X,8,X:NEXT X:SOUND 0,0,0,0:SO=1:SOO
   =1:RETURN
TI 310 REM * MOVE ANTS *
JJ 315 IF IMAGE=1 THEN IMAGE=0:PR=PAR1:PL
   =PAL2:GOTO 325
GC 320 IF IMAGE=0 THEN IMAGE=1:PL=PAL1:PR
   =PAR2
NS 325 A=USR(MOVE,0,PMB,PR,XA,Y-1,4)
BO 330 A=USR(MOVE,1,PMB,PR,XB,Y,4)
LS 335 A=USR(MOVE,2,PMB,PL,XC,Y-1,4)
ZO 340 A=USR(MOVE,3,PMB,PL,XD,Y,4)
ZW 345 RETURN
```

```
LU 350 REM * SET UP SCREENS *
DH 355 GRAPHICS 0:DL=PEEK(560)+256*PEEK(5
   61)
LO 360 POKE DL+3,68:FOR X=6 TO 26:POKE DL
   +X,PEEK(DL+X)+2:NEXT X:? "K"
GR 365 POKE 106,RAMTOP-TX:POKE 559,34:POK
   E 752,1
PL 370 POKE 89,RAMTOP-TX:TX=TX+4
KY 375 POSITION 11,0:? "$$$$$$$      $$$$$$$
   "
LC 380 POSITION 11,1:? "$$$$$$$      $$$$$$$
   "
SJ 385 POSITION 11,21:? "├_●+ ▁ ▌▖▂▀ ┿├_
   ●+":REM CTRL "ANTS IN YOUR PANTS"
UV 390 POSITION 0,22:? "SCORE ";SCO;"
                    HIGH ";HSC
AG 395 RETURN
```




```
YO 400 POSITION 13,2:? LLEG$(6,LEN(LLEG$)
   ):POSITION 23,2:? RLEG$:RETURN
BR 405 POSITION 14,2:? LLEG$(6,LEN(LLEG$)
   ):POSITION 24,2:? RLEG$:RETURN
DS 410 POSITION 15,2:? LLEG$(6,LEN(LLEG$)
   ):POSITION 25,2:? RLEG$:RETURN
VT 415 POSITION 13,2:? LLEG$:POSITION 23,
   2:? RLEG$(6,LEN(RLEG$)):RETURN
XG 420 POSITION 14,2:? LLEG$:POSITION 24,
   2:? RLEG$(6,LEN(RLEG$)):RETURN
ZV 425 POSITION 15,2:? LLEG$:POSITION 25,
   2:? RLEG$(6,LEN(RLEG$)):RETURN
UG 430 POSITION 15,2:? LLEG$(6,LEN(LLEG$)
   ):POSITION 23,2:? RLEG$(6,LEN(RLEG$)):
   RETURN
ZV 435 RETURN
MK 440 REM * AMOUNT OF ANT MOVEMENT *
KX 445 XAA=RND(0)*Z+0.5:XBB=RND(0)*Z:XCC=
   RND(0)*Z:XDD=RND(0)*Z+0.5:RETURN
NE 450 REM * PILE ANTS *
NE 455 XW=INT(RND(0)*3):FOR SC=0 TO 28 ST
   EP 4:POKE 89,RAMTOP-SC
QI 460 COLOR ASC("%"):PLOT 19+XW,16-INT(H
   EIGHT):NEXT SC:HEIGHT=HEIGHT+0.4:IF HE
   IGHT>15 THEN GOTO 990
IS 465 FOR X=0 TO 20 STEP 2:SOUND 0,X,8,1
   2:NEXT X:SOUND 0,0,0,0:Z=Z+0.1:POKE 77
   ,0:RETURN
WQ 470 REM * SQUASH *
ZU 475 IF PEEK(53252) THEN XA=40:GOTO 495
AY 480 IF PEEK(53253) THEN XB=40:GOTO 495
IF 485 IF PEEK(53254) THEN XC=207:GOTO 49
   5
JG 490 IF PEEK(53255) THEN XD=207
LS 495 FOR X=60 TO 0 STEP -10:SOUND 0,X,1
   0,14:NEXT X:SOUND 0,0,0,0
EF 500 SCO=SCO+1:Z=Z+0.03:POKE 77,0
WV 505 GOSUB 445
YA 510 FOR X=0 TO 28 STEP 4:POKE 89,RAMTO
   P-X
UJ 515 POSITION 6,22:? SCO;"   ":NEXT X:P
   OKE 53278,1:RETURN
ST 520 REM * EDIT CHSET *
FB 525 POKE 106,PEEK(106)-5:CHSET=(PEEK(1
   06)+1)*256
HE 530 CHI=CHSET/256:CLO=0:POKE 203,CLO:P
   OKE 204,CHI
SE 535 DIM XFR$(28):RESTORE 540:FOR N=1 T
   O 28:READ ML:XFR$(N,N)=CHR$(ML):NEXT N
NG 540 DATA 104,169,0,133,205,168,169,224
   ,133,206,177,205,145,203,200,208
TB 545 DATA 249,230,204,230,206,165,206,2
   01,228,208,239,96
JM 550 XFR=USR(ADR(XFR$))
AP 555 RESTORE 575
MW 560 READ A:IF A=-1 THEN RETURN
HA 565 FOR Z=0 TO 7:READ J:POKE CHSET+A*8
   +Z,J:NEXT Z
QA 570 GOTO 560
DO 575 DATA 1,10,10,10,6,6,1,1,1
PJ 580 DATA 3,170,170,170,106,170,170,170
   ,169
DY 585 DATA 4,254,254,254,254,254,254,254
   ,254
LN 590 DATA 5,65,125,20,20,65,20,65,65
SK 595 DATA 32,160,160,160,144,80,64,64,6
   4
RK 600 DATA 64,0,0,0,0,0,0,0,0
VX 605 DATA 65,16,68,136,168,204,204,68,0
NP 610 DATA 73,84,16,32,32,48,252,84,0
RV 615 DATA 78,80,84,136,136,204,204,68,0
WU 620 DATA 79,16,68,136,136,252,252,84,0
UR 625 DATA 80,80,68,136,160,128,192,64,0
NQ 630 DATA 82,80,68,136,160,204,204,68,0
WG 635 DATA 83,20,64,128,32,12,252,84,0
ZE 640 DATA 84,84,16,32,32,48,48,16,0
ZU 645 DATA 85,68,68,136,136,252,252,84,0
OL 650 DATA 89,68,68,136,32,32,48,32,0
PZ 655 DATA 96,7,94,250,170,170,105,85,20
NY 660 DATA 97,255,170,170,170,170,86,21,
   5
IU 665 DATA 98,170,170,170,165,165,149,85
   ,80
FJ 670 DATA 99,170,170,150,85,85,85,0,0
FU 675 DATA 100,170,170,170,106,86,85,21,
   1
KI 680 DATA 101,170,170,170,170,169,85,85
   ,85
DR 685 DATA 102,164,164,164,148,84,84,80,
   80
BL 690 DATA 103,26,26,22,6,6,5,1,1
MJ 695 DATA 104,170,170,170,170,169,85,85
   ,85
UM 700 DATA 105,170,170,150,85,85,85,80,0
QX 705 DATA 106,170,170,170,106,86,85,5,1
YI 710 DATA 107,170,170,170,170,165,85,84
   ,80
NQ 715 DATA 108,255,170,170,170,90,86,21,
   5
JS 720 DATA 109,0,232,188,168,168,164,84,
   80
LA 725 DATA 110,0,0,0,3,14,58,234,170
GM 730 DATA 111,15,58,234,170,170,170,170
   ,170
SH 735 DATA 112,170,106,170,170,170,170,1
   66,170
CP 740 DATA 113,160,168,168,168,168,152,1
   68,164
JV 745 DATA 114,170,166,170,170,170,170,1
   05,150
JY 750 DATA 115,0,0,0,192,128,176,160,160
UW 755 DATA 116,10,42,38,42,42,42,41,26
VS 760 DATA 117,224,184,174,171,170,170,1
   70,170
WX 765 DATA 118,0,0,0,0,224,184,174,171
NJ 770 DATA 119,0,0,3,2,2,14,10,10
OT 775 DATA 120,106,42,38,42,42,42,42,26
BX 780 DATA 121,160,160,160,160,160,160,1
   60,160
XO 785 DATA 122,10,10,10,9,10,10,10,10
IR 790 DATA 123,169,168,168,168,168,168,1
   68,104
XT 795 DATA 127,16,24,28,30,28,24,16,155
GD 800 DATA -1
HB 805 REM * DLI Made with DLI Maker    by
   Greg Anderson in Analog No. 38     *
VP 810 POKE 559,Z:RESTORE 860:READ DNUM
```

```
OL 815 D=PEEK(560)+256*PEEK(561)
EQ 820 FOR I=1 TO DNUM:READ B:POKE D+B,PE
   EK(D+B)+128:NEXT I
VI 825 B=INT(ADR(DLI$)/256):A=ADR(DLI$)-B
   *256:POKE 512,A:POKE 513,B
ES 830 POKE 54286,192:POKE 256,Z:POKE 559
   ,46:RETURN
XW 835 DIM DLI$(85)
PS 840 DLI$="H▬♥Hn♥H▲TI♥P\)p▬┘Phe I HP◢-┣┣
   ▬┘Phe I P→)♥▬"
DL 845 DLI$(41)="┘P▬●♥▬ P▬ |H┬P▬┘ H┘P▬┤ H▬
   |Phe)♥▬♥H)♥▬┘P)●"
AI 850 DLI$(81)="▬ ▟he"
AD 855 RETURN
FL 860 DATA 4,2,21,24,26
TK 865 REM * P/M MOVER from the Analog Co
   mpendium *
XU 870 RESTORE 940
YK 875 DIM PMMOV$(100),AL1$(10),AL2$(10),
   AR1$(10),AR2$(10):MOVE=ADR(PMMOV$)
QU 880 FOR X=1 TO 100:READ N:PMMOV$(X)=CH
   R$(N):NEXT X
XU 885 FOR X=1 TO 4:READ N:AL1$(X)=CHR$(N
   ):NEXT X
YI 890 FOR X=1 TO 4:READ N:AL2$(X)=CHR$(N
   ):NEXT X
DW 895 FOR X=1 TO 4:READ N:AR1$(X)=CHR$(N
   ):NEXT X
DR 900 FOR X=1 TO 4:READ N:AR2$(X)=CHR$(N
   ):NEXT X
EK 905 PMBASE=INT((PEEK(145)+3)/4)*4:POKE
    54279,PMBASE
RB 910 PMB=PMBASE*256
GU 915 PAL1=ADR(AL1$):PAL2=ADR(AL2$):PAR1
   =ADR(AR1$):PAR2=ADR(AR2$)
PY 920 POKE 559,46:POKE 53277,3
ES 925 POKE 704,0:POKE 705,34:POKE 706,0:
   POKE 707,34
ZL 930 RETURN
GB 935 REM * P/M MOVE DATA *
UD 940 DATA 216,104,104,104,133,213,104,2
   4,105,2,133,206,104,133,205,104,133,20
   4,104,133,203,104,104,133,208
IS 945 DATA 104,104,133,209,104,104,24,10
   1,209,133,207,166,213,240,16,165,205,2
   4,105,128,133,205,165,206,105
IK 950 DATA 0,133,206,202,208,240,160,0,1
   62,0,196,209,144,19,196,207,176,15,132
   ,212,138,168,177,203,164
LR 955 DATA 212,145,205,232,169,0,240,4,1
   69,0,145,205,200,192,128,208,224,166,2
   13,165,208,157,0,208,96
VD 960 REM * IMAGE DATA *
PT 965 DATA 128,110,126,42
MR 970 DATA 128,110,126,21
GL 975 DATA 1,118,126,168
OI 980 DATA 1,118,126,84
IC 985 REM * SHOW SCORE *
DL 990 IF SCO>HSC THEN HSC=SCO
ZX 995 FOR P=90 TO 3 STEP -3:SOUND 0,P,10
   ,12:NEXT P
QB 1000 FOR P=3 TO 90 STEP 2:SOUND 0,P,10
   ,12:NEXT P:SOUND 0,0,0,0
DQ 1005 FOR SC=0 TO 28 STEP 4:POKE 89,RAM
   TOP-SC:POSITION 12,22:? " PRESS FIRE 
   ":NEXT SC
PW 1010 M=INT(RND(0)*5)*4+4
BD 1015 POKE DL+5,RAMTOP-M:SOUND 0,100-M,
   8,6:FOR W=1 TO M/6:NEXT W:SOUND 0,0,0,
   0:FOR W=1 TO M/8:NEXT W
NK 1020 IF STRIG(0)<>0 THEN 1010
DI 1025 FOR X=0 TO 28 STEP 4:POKE 89,RAMT
   OP-X:FOR YX=2 TO 18:POSITION 19,YX:? "
    ":NEXT YX
OJ 1030 SCO=0:Z=4.5:HEIGHT=0:SOUND 0,0,0,
   0
CU 1035 POSITION 0,22:? "SCORE ";SCO;"
                    HIGH ";HSC:NEXT X
AL 1040 RETURN
HP 1045 DIM LLEG$(150),RLEG$(150)
HR 1050 LLEG$="#p↓←←p#↓←←pp↓←←##↓←←p#↓←←←
   wpp↓←←←z#♦↓←←←←!p#↓←←pps↓←←←##y↓←←←pp@↓
   ←←←p#↓←←#p↓←←prs"
XB 1055 LLEG$(LEN(LLEG$)+1)="↓←←←←←noppq↓
   ←←←←←←←♦abcdef"
WD 1060 RLEG$="#p↓←←p#↓←←pp↓←←##↓←←p#↓←←p
   #s↓←←←xpy↓←←←p#@↓←←←←wp#↓←←←zpp↓←←←!p#
   ↓←←p#↓←←#p↓←←←"
RP 1065 RLEG$(LEN(RLEG$)+1)="wp#↓←←←tppuv
   ↓←←←←←ghijklm "
AU 1070 RETURN
CQ 1075 REM * TITLE PAGE *
HA 1080 GRAPHICS 0:DL=PEEK(560)+256*PEEK(
   561):POKE 752,1:POKE 708,184
JR 1085 POKE DL+6,6:POKE DL+7,7:POKE 710,
   128
CL 1090 POSITION 15,0:? "PRESENTING":POSI
   TION 20,1:? " ANTS IN YOUR PANTS
        By Allan Knopp"
ON 1095 ? :? "  Benny has gone out for a
   day in the":? "country. He is tasteful
   ly dressed in"
LP 1100 ? "his favourite pair of pink str
   iped":? "Bermuda shorts. Unfortunately
    there"
YV 1105 ? "is a particularly vicious colo
   ny of":? "ants in the field where he i
   s taking"
GL 1110 ? "a picnic and the sight of Benn
   y's":? "shorts drives them mad."
VS 1115 ? " The only way Benny can stop t
   hem":? "is to stamp on them before the
   y can"
TD 1120 ? "reach the centre where they wi
   ll":? "stand on each other until they
   can"
NV 1125 ? "invade Benny's Bermudas.":? "
   Unfortunately the more ants Benny"
PY 1130 ? "squashes, the madder they get
   and the":? "faster they run. The red a
   nts are"
ZW 1135 ? "the most difficult to kill.":?
    :? "          Press  START "
SQ 1140 IF PEEK(53279)<>6 THEN 1140
QN 1145 GOTO 105
```

```
EI 1 REM ****************************
WE 2 REM *        LINE MAKER for        *
NE 3 REM *      ANTS IN YOUR PANTS      *
EB 4 REM * ---------------------------- *
IY 5 REM *   PAGE 6 MAGAZINE   ENGLAND  *
EN 6 REM ****************************
VC 115 DIM DLI$(90)
MB 120 FOR A=1 TO 85:READ I:CHK=CHK+I:NEX
   T A:IF CHK<>8368 THEN ? "PLEASE CHECK
   DATA":END
WK 125 ? "K":RESTORE
FB 130 ? "":? :? "NEW":? :? :? "840 D
   LI$=";CHR$(34);:POKE 766,1:FOR I=1 TO
   40:READ A:? CHR$(A);:NEXT I:? CHR$(34)
BH 135 ? "845 DLI$(41)=";CHR$(34);:FOR I=
   41 TO 80:READ A:? CHR$(A);:NEXT I:? CH
   R$(34)
WK 140 ? "850 DLI$(81)=";CHR$(34);:FOR I=
   81 TO 85:READ A:? CHR$(A);:NEXT I:? CH
   R$(34):? "POKE 842,12"
TN 145 POSITION 0,0:POKE 766,0:POKE 842,1
   3
CD 150 DATA 72,173,0,1,238,0,1,141,10,212
   ,201,0,208,7,169,112,141,26,208,104,64
   ,201,1,208
DA 155 DATA 8,173,1,1,141,26,208,104,64,2
   01,2,208,31,169,0,141,26,208,173,20,0
PS 160 DATA 141,22,208,173,2,1,141,23,208
   ,173,3,1,141,24,208,173,4,1,141,25,208
   ,104,64,169,0,141
OE 165 DATA 0,1,169,0,141,24,208,169,224,
   141,9,212,104,64
```

WHAT HAVE YOU MISSED?

BACK ISSUES

PAGE 6 back issues represent an excellent way of increasing the enjoyment of your Atari with articles to enlighten you, programs to type in and reviews of software to guide you. Almost all of the content of past issues will be as fresh and relevant today as when it appeared – increase your enjoyment now, before it's too late!

ISSUE 19 – The first coverage of the ST but, not to be outdone, plenty for the 8-bits. A great machine-language space game SECTOR 10, a super utility, Magfile, to keep track of your books and magazines plus The Chase. The second part of our series on Display Lists, build your own Speech Synthesiser, a review of 1985, in-depth Adventure reviews and plenty more.

ISSUE 20 – GRAPHICS SPECIAL. A super special issue with a graphics theme. Draw some masterpieces with GRAPHICS WORKSHOP and explore your graphics potential with Colour Palette, Picloada, Colour Attributes and CIO Slideshow. An in-depth review of Printshop and Graphics Art Department, the final part of Display Lists and the Adventure column. 11 pages devoted to the ST plus a colour feature ATARI ART and ST GALLERY. And there's more! BLOCKBREAKER is one of the best games to have been published in any magazine. Don't miss it!

ISSUE 21 – A packed issue with games, TRAIN CRAZY, Revenger and Forklift. Utilities Scalemaster, Quick Disassembler and Measuring Temperature. Programming hints with Doing The Impossible, Error 8 Solved and THE GUIDE TO ERROR CODES. Reviews of Flight Simulator II, Hitchhiker's Guide to the Galaxy, and the latest Adventures. For the ST a DEGAS to NEO converter, Lattice C reviewed and reviews of a whole host of software.

ISSUE 22 – More serious users will enjoy SMARTSHEET, a Visicalc like type-in spreadsheet, and our review of Paperclip whilst gamesters will puzzle over Tricky Cubes and try to survive Hidden Depths. The Guide to Error Codes is concluded and there are articles on Fractals, Tape Problems and some less well known Adventures. Loads of reviews and some great new routines for Blockbreaker. ST users will find out how to program Sprites and can read reviews on Time Bandit, Pro-Fortran 77, VIP Professional and more.

ISSUE 23 – Another superb machine language game Water Ski School will test your reflexes. Wordsearch will challenge those who like puzzles and other listings include Superclown and the utilities Xref and Verify. A huge review of Ultima IV heads a comprehensive review section and Going Online Part 1 will let you know if telecommunications is for you. ST owners can discover how to get a bigger screen on their colour monitor and read reviews of Zoomracks, Sierra On-Line adventures and Pro-Pascal amongst others. Also, is it worth adding a 5¼" drive to your ST?

ISSUE 24 – The biggest issue so far published! Great ST section with info about ST disks and cartridges and loads of reviews. For 8-bit users there is MUNCHY MADNESS, the best game we have ever published plus a super cheque book utility AUTOCHECK. Plus all about checking your disk drive, another game, more utilities, reviews of RAMBIT, Adventure games and lots more. Too much in this issue to list fully!

ISSUE 25 – Another biggie! A must for 1029 printer owners with 3 great utilities including a screen dump. A super Japanese chess game called SHOGI, a type in REVISION C BASIC, a full feature on disks and more. For ST, type in OTHELLO, reviews of LEADER BOARD and MEAN 18, Hints and Tips and several other reviews and articles.

ISSUE 26 – SOLID MODELLING is one of the best programs we have published. Be creative! Other programs include SOURCE WRITER for machine code programmers, FLEXIBLE FINGERS to help you type, NUTS and more. Reviews of TRIVIAL PURSUIT, DVC/65, SPEEDSCRIPT and much, much more. ST users can learn all about HARD DISKS, FAST BASIC, TYPESETTER ELITE, DEGAS ELITE and read reviews on a whole lot more software.

All back issues are £1.20 each in the U.K., £1.95 for Europe or surface mail elsewhere and £2.75 for Air Mail outside Europe. Please make cheques/postal orders payable to PAGE 6. Send your order to PAGE 6, P.O. BOX 54, STAFFORD, ST16 1DR, ENGLAND.

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ISSUE 16 – Contains BLACK BOX, FREEWAY ACE!, DRAUGHTS, TURN THE TABLES, AUTOCAR GRAPH and CHARACTER PLOTTING programs.

ISSUE 17 – Contains RENUM, SHOOTING GALLERY, X-Y-ZAP, INLAY CARDS, CASTLE MORGUE, MATTHEWS LABEL MAKER and several programs on ANTIC modes 4/5.

ISSUE 18 – Contains BERTIE, GRAND PRIX II, BLITZ, LISTER, STARS, TYPO 3 and several programs on Display Lists.

ISSUE 19 – Contains SNOWFALL, THE CHASE, MAGFILE, SECTOR 10, STARKIES UTILITIES plus programs for the Speech Synthesiser and several programs on Display Lists.

ISSUE 20 – Contains BLOCKBREAKER, GRAPHICS WORKSHOP, COLOUR PALETTE, PICLOADA, COLOUR ATTRIBUTES, CIO SLIDE SHOW plus more Display List programs and pictures for Graphics Workshop.

ISSUE 21 – Contains REVENGER, TRAIN CRAZY, FORKLIFT, SCALEMASTER, DOING THE IMPOSSIBLE, QUICK DISASSEMBLER and MEASURING TEMPERATURE.

ISSUE 22 – Contains SMARTSHEET, TRICKY CUBES (two versions), HIDDEN DEPTHS and new versions of BLOCKBREAKER. DOUBLE SIDED DISK.

ISSUE 23 – Contains utilities XREF and VERIFY! Games SUPERCLOWN and WATER SKI SCHOOL (in machine language). The word puzzle game WORDSEARCH as well as COLOUR MAGIC demos and TWO BONUS programs!!

ISSUE 24 – Contains the complex check balancing program AUTOCHECK and MUNCHY MADNESS, the best game we have ever published!. Plus another game FLYING HIGH and two superb utilities, SPEED CHECK and MENU. A very full disk and not to be missed.

ISSUE 25 – Contains the chess program SHOGI, a page flipping demo, BOUNCING BERT, and three 1029 printer utilities, LIST 1029, SCREEN DUMP and SMALL FONT. A must for all 1029 owners.

ISSUE 26 – TWO virtually full sides with bonus screens for SOLID MODELLING! Check them out. Also SOURCE WRITER for machine code programmers, FLEXIBLE FINGERS to help you type, a game of NUTS, DESIGNER LABELS for EPSON printers and YOUR OWN CURSOR plus any others in this issue.

ISSUE 27 – Contains – all the program listings from this issue.

PAGE 6 Issue disks will run on any 8-bit Atari with 48k or 64k memory. Each disk is just £3.95. Compare that for value!

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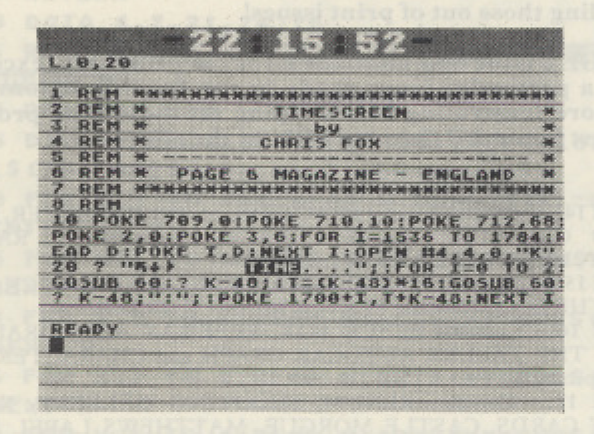
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TIME SCREEN



XL/XE ONLY

Would you like a more attractive screen to type in all those programs? How about a time check as well? TimeScreen will give you just that and is fully reset proof. One other bonus is that the keyboard is speeded up to make typing easier.

The new screen on TimeScreen gives you black text on a white background with a blue border. At the top of the screen a 12 hour digital clock is displayed showing hours, minutes and seconds, either as time elapsed since starting a session or as the correct time of day. Typing in the program is simple using Typo 3 but, unfortunately, as both TimeScreen and Typo use page 6 of memory it will not be possible to run both together for future listings. You can, however, use Typo to check a program that has already been entered if you follow the procedure below.

When you run the program the word 'Time...' will appear at the top of the screen. The current time can be entered by typing six digits representing the time in a 12 hour digital format. For example, enter 063000 for half past six. Press the RETURN key and the clock will start. You may reset the clock to zero at any time by pressing CONTROL-4 and restart it by pressing any key.

TimeScreen should only be used for typing or working with DOS as the routines used may clash with other programs. System Reset is vectored through CASINI to a machine code routine located at page 6 ($600). The code uses a stage 1 VBI to update the clock and check the display list. If location 560 (display list pointer low byte) is altered, the VBI resets the screen making graphics calls impossible. It also ensures that the display stays put when you use DOS. Before running a program the VBI should be switched off which can be achieved by pressing SHIFT-CONTROL-5. This will perform a proper Graphics 0 call. System reset will reset TimeScreen.

Just a couple more points. If you wish to use page 6 for any reason, type POKE 9,1 if you are using a disk drive or POKE 9,0 if not, then press System Reset. TimeScreen will no longer be usable. When using DUP.SYS, return from the menu by using Option B (Run Cartridge) and then press System Reset. This will restart the VBI.

I hope you enjoy the new screen and maybe now you will notice the time in those long programming sessions!

```
EI 1 REM ********************************
JM 2 REM *          TIMESCREEN           *
LR 3 REM *              by               *
JZ 4 REM *          CHRIS FOX            *
EC 5 REM * ----------------------------- *
IZ 6 REM *   PAGE 6 MAGAZINE - ENGLAND   *
EO 7 REM ********************************
NN 8 REM
KU 10 POKE 709,0:POKE 710,10:POKE 712,68:
   POKE 2,0:POKE 3,6:FOR I=1536 TO 1784:R
   EAD D:POKE I,D:NEXT I:OPEN #4,4,0,"K"
MD 20 ? "↖↓▶        TIME....";:FOR I=0 TO 2:
   GOSUB 60:? K-48;:T=(K-48)*16:GOSUB 60:
   ? K-48;":";:POKE 1700+I,T+K-48:NEXT I
YT 30 ? "◀":? "▶↓            PRESS RETURN"
MW 40 CLOSE #4:IF PEEK(764)<>12 THEN 40
AZ 50 X=USR(ADR("▨▪▪◰▪ ♥/h◆")):END
HG 60 GET #4,K:IF K<48 OR K>57 THEN 60
ZX 70 RETURN
NX 100 REM .
WX 110 REM .      |STORE CODE AT $600|
QC 120 REM .
QS 130 REM
OA 1000 DATA 216,160,48,162,6,138,32,92,2
   28,169,140,141,196,2,169,0,141,197,2,1
   69,11,141,198,2,141,217,2,169,3
KZ 1010 DATA 141,218,2,169,116,141,200,2,
   160,192,162,6,140,48,2,142,49,2,96,248
   ,160,3,24,185,164,6,105,1,153
HZ 1020 DATA 164,6,89,168,6,208,6,153,164
   ,6,136,16,236,216,165,66,208,85,160,13
   ,162,2,189,164,6,72,41,15,9
BR 1030 DATA 16,153,172,6,136,104,56,106,
   74,74,74,153,172,6,136,136,202,16,230,
   173,48,2,77,247,6,240,3,32,9
YD 1040 DATA 6,173,9,210,201,221,208,25,1
   72,0,228,174,1,228,200,140,147,6,142,1
   48,6,160,95,162,228,169,6,32,92
GX 1050 DATA 228,32,0,0,73,152,208,8,160,
   3,153,164,6,136,16,250,76,95,228,0,0,0
   ,0,18,96,96,80,0,0,0,0,0
OQ 1060 DATA 77,16,16,90,16,16,90,16,16,7
   7,0,0,0,0,0,16,71,172,6,16,66,64,156,0
   ,2,0,2,0,2,0,2,0,2,0,2,0,2,0,2,0,2,0
WL 1070 DATA 2,0,2,0,2,0,2,0,2,0,2,0,2,0,
   2,0,2,0,2,0,2,0,2,0,2,0,2,65,192,6
```

by Chris Fox

Contact

HELP WANTED

ST TRANSPUTER: Merseyside Atari Club wishes to hear from experienced C programmers to gain experience in OCCAM for the new ST Transputer from Kuma. Please write to Merseyside Atari Club (MAC) 24, Oakdene Road, Anfield, Liverpool, Merseyside, L4 2SR

MICROSOFT BASIC: On the 8-bit version, double precision arithmetic does not work correctly. Can anybody who has found this problem offer a solution please? The Atari helpline did not know of it. Phone Keith on Chelmsford (0245) 269030

HORSE RACING: Anyone interested in Flat and National Hunt racing please contact. Would like assistance with programs etc. 130XE and disk at present but considering purchase of ST soon. Don Burley, 177, Legsby Avenue, Grimsby, South Humberside. Phone 74550

INFOCOM: Could anyone give me hints on BALLYHOO and WISHBRINGER. I am having trouble getting into Katzenjammers trailer in BALLYHOO and passing the troll at the toll bridge in Wishbringer. I have racked my brains and reracked them but I can't find my way past! Chris Johnson, 26, Henderson Street, North Rockhampton, Q. 4701, Australia

HINTS AND TIPS: I am compiling a list of hints and tips for Atari's wide range of software and I need your help. If you know of any cheat codes, passwords, clues etc. then please write to me. David Rutter, 30, Birchgate, Bucknall, Stoke-on-Trent, ST2 8JT

1029 HELP: Could anyone tell me if it is possible to obtain italics on the 1029 printer and if so how? Write to David Rutter, 30, Birchgate, Bucknall, Stoke-on-Trent, ST2 8JT

STEVE PHILLIPS OF BRISTOL: I have lost your full address and wish to contact you about our mutual Atari interest. Please write to Andrew Cole, 83, Alfoxton Road, Bridgwater, Somerset, TA6 7NW

PAPERCLIP: Help required using this with XMM 801 printer, particularly configuring files. Please write or phone. A.J. Domaradzki, 49, Harewood, Isleworth, Middx, TW7 5HN. Tel. 01 847 2472

HELP WITH XMM 801: We have an XMM 801 and are delighted with the print quality but cannot find any programs to run with it. Can any of the 1029 printer programs from PAGE 6 be adapted? Any help at all with software, label or print programs would be greatly appreciated. John and Leni Cooper, 79, Hassock Lane, Shipley, Heanor, Derbyshire DE7 7JB

PEN PALS

PEN PALS WANTED: From Ireland and anywhere in the world. I have an Atari 800XL and 1010 recorder. Please write to Daran Gibney, Belview, Crossakiel, Kells, Co. Meath, Ireland

WANTED: Pen pals to swap hints and tips on adventure games or arcade. I have 130XE, 1050 disk drive and 1027 printer. Also interested in making electronic add-ons for my Atari. Contact Simon Jenkins, 1, Greenwood Road, Victoria Village, Abersycham, Pontypool, Gwent, S. Wales, NP4 8QA

ST PEN PALS WORLDWIDE: I would like to swap ideas and tips about hard and software with ST users worldwide. I have a 520ST+ (1 meg), SF314, GE TXP-8100 printer and colour monitor. Please write to Michel van Deventer, Postbus 214, 2350 AE Leiderdorp, Holland

PEN PALS: I am searching for pen pals all over the world to swap hints and ideas. Please write to J.P. Adriaanse, Lebuinusstraat 5, 2382 XN Zoeterwoude, Holland

PEN PAL: I am 15 years old and I own an 800XL, 1010 recorder and 1050 disk drive. I would like a pen pal anywhere in the British Isles. Please write to Robert Gawthorpe, 27, Hayburn Avenue, Hull, HU5 4NB

ST FRIENDS WANTED: For swapping hints and tips. Can be of any age and from anywhere. All letters will be answered. Please write to Zarim A. Baker, Room 9B, Bexley Hospital, Bexley, Kent DA5 2BW or phone 0332 526282 extension 2251 and ask for Room 9B (evenings only)

ST PEN PALS WANTED: I wish to contact other ST users around the world to swap hints and tips etc. All letters will be answered. Please write to David Matthews, Baltrasna, Ashbourne, Co. Meath, Ireland. Also a special hello to RAY down under....

FROM FRANCE: I am a French Atari user and I want to know more about English Atari users. I wish to correspond with an Atari friend to exchange ideas and learn English. I own an Atari 800XL with 1050 disk drive and an Atari 520STF. Houchart Ludovic, Val De L'Olivet, Pont D'Ucel, 07200 Aubenas, France

PEN PAL WANTED: Especially in Germany or the U.S. I own an 800XL and 1050 disk drive. I would like to swap hints on gaming. All letters will be answered. Please write to Richard Prescott, 54, Middlefield Avenue, Hurst Green, Halesowen, West Midlands, B62 9QL

FOR SALE

ULTIMON: For sale as new to fit 800, £30. 800XL with power unit, £35. ANTIC Vol.2 issues 3,4,8,9 and Vol.3 issue 2, £5. Machine Language for Beginners, £5. Phone Keith on Chelmsford (0245) 269030

FOR SALE: Atari cartridges – Pacman, Centipede, Donkey Kong, Dig Dug, Qix, Chess and Assembler Editor, £5 each plus 50p postage or £30 the lot. 800 computer with BASIC Rev.3 cartridge plus ATARI BASIC book and instructions to upgrade to 288k. £35 inc. p&p. 30 ANTIC and ANALOG magazines plus ACE newsletters, £30 plus p&p. Phone John Dimmer on 0980 22991

1027 PRINTER: For sale, including spare ink roller and AtariWriter disk, £70. Also Commodore 1701 monitor, includes leads to connect to an 800XL, reasonable offers considered. Contact S.G. Lilgert, Main Street. Helperby, York. YO6 2PS (Sorry no telephone)

FOR SALE: 1027 printer with AtariWriter, £69. 1020 plotter with lots of paper, pens and graphics software, £29. Megafont II+, £8. Two Quickshot II joysticks, £3 the pair. Machine Language for Beginners, £5. Programmers Reference Manual (SAMS), £5. The Micro Enquirer (Atari XL Edition), £2. Phone Alva Grannell on Norwich 31122, office hours please.

FOR SALE: 810 disk drive, £70. Seikosha GP-80M Centronics printer, £75. Fast Chip ROM for the 400/800, £12. 400 replacement typewriter keyboard, £16. Atari Assembler Editor cart., £16. Speech Synth. for 6502/Z80 micros, £30. Empire of The Overmind, Lords of Karma and GFS Sorceress, £6 each. Tel. R.W. Hearn on 0502 66026

MAGAZINES FOR SALE: ANTIC Vol.2 No's 2, 3, 4, 5, 8, 9, 12, Vol. 3 No's 4, 11. PAGE 6 issues 7, 10, 12 – 18. Also Best of ANTIC Vol.1. Will separate. Offers to John George, 4, Hall Gardens, Polebrook, Peterborough. Tel. 0832 74037

OMNI READER: For sale. Unwanted gift. Requires RS-232 and modem software. Price £35 or will swap for Touch Tablet. A.R. Robson, 62, Brooke Road, Oakham, Leics. Tel 0572 3626

1029 PRINTER: For sale in perfect condition with AtariWriter disk. £60. Stephen Williamson. Tel. 061 226 3504

FOR SALE: PAGE 6 issues 13 to 24. Atari User July '85 to March '87. Atari Assembler Editor, 2 Compute! books, Atari XL Graphics handbook, De Re Atari. All in excellent condition. Offers please. Call Daniel on Watford (0923) 54381

FOR SALE: Philips 80 column green screen monitor, composite video input, £45. A.I.D. modem interface with R-Verter smart terminal software 300/1200 baud, £30 (does not include modem). Phone Nigel Abel on 01 310 4250

FOR SALE: De Re Atari, Inside Atari DOS, First and Second Books of Compute! books and Compute Book of Graphics. Synfile+, Syncalc, New Paperclip with Spellpack, all upgraded to use full memory of 130XE. Offers. Tel. Maurice R. Pearson on 0955 2450

ATARI 800: For sale with data recorder. Open to offers. Tel 0782 281599 or write to David Rutter, 30, Birchgate, Bucknall, Stoke-on-trent, ST2 8JT

COMPLETE KIT FOR SALE: 130XE, 1050 disk drive, 1050 plus Happy disk drive, joysticks, cartridges, BASIC XL, cassette deck, £100 worth of software, books and magazines. Worth over £700. Will sell for £350 or will split. James Kemp, 64, Springfields, Tilehurst, East Sussex, TN5 7BS or ring 0580 200070 after 7 p.m.

More overleaf

Contact

FOR SALE: Atari 800, 1010 data recorder, joystick, software manual, Atari Games and Recreations, PAGE 6 issues 1 to present, Monitor magazine issue 3 to present. Computer still under guarantee. £100 o.n.o. Tel. P. Dungworth on 0742 552113 (evenings)

SYSTEM SALE: Atari 64k XL, 1050 disk drive, 1010 cassette, joystick, paddles, 3 BASIC programming books plus variety of software. £150 the lot. J. Parkinson, 59, Elm Road, Chessington, Surrey, KT9 1AF. Tel. 01 397 4406

WANTED

MAGAZINES: Old numbers of PAGE 6/ANALOG/ANTIC. Best prices paid. Please let me hear something from you. Soffers Robert, Bredabaan 820, 2130 Brasschaat, Belgium

BOOKS WANTED: Wanted by collector – books on Atari 800XL and 130XE computers. Also Atari specialist magazines, computer programs (for Atari 8-bit) for use in titling videos, designed to own specifications. J.C. McNeill, 15, Dalnottar Drive, Old Kilpatrick, Strathclyde, G60 5DP

BACK ISSUES: I am looking for the following PAGE 6 magazines. Issues 1 to 12 and 14 to 18. Please write with price. Lermitte Mario, Bruiloftstraat 16, 9219 Gentbrugge, Belgium

TRIPPLER BOARD: Can anyone sell me a TRIPPLER BOARD made by Computer Support. I have the XOS chip but need to run this and the old OS. Or can anyone give me details of the board as I believe Computer Support have gone out of business. M.J. Orme, 66, Valley Rise, Swadlincote, Burton-on-Trent, Staffs, DE11 0QE

MAC 65 ASSEMBLER: Cartridge wanted. Please phone Andy Mills with price. 0623 27641 between 8.30 a.m. and 4.30 p.m.

BACK ISSUES: Copies of PAGE 6 issues 1 and 18 wanted to complete set. Would consider a loan for photocopying (postage will be refunded). Please contact Dave Logan, Cardiff (0222) 821629 daytime or 598440 evenings

CONTACT is free for private individuals or clubs. Entries are accepted at the Editor's discretion. We will not normally accept notices for the sale or exchange or disk or tape based software. Just write your notice on a sheet of paper headed CONTACT and send it in!

WANTED: XMM 801 printer or software-less parallel interface to suit 130XE. Contact Rod Knowles 0744 55192

PRINTER WANTED: I have an Atari 400, 410 recorder, BASIC cartridge, manual and software. I want 1029 or 3rd party printer/plotter or 850 interface. Anyone offer me a deal? Phone Steve on 047 684 522

CLUBS

MACCLESFIELD COMPUTER CLUB: Meets every other Tuesday evening at the Bulls Head, Market Place, Macclesfield. Atari well represented. New members very welcome.

STARTARI UK: Welcomes users from all over the world to contact them for hints and tips and ideas on all Atari matters. All letters answered and help where required. Write to John Rogers, 26, Bromley Gardens, Parkside, Houghton Regis, Dunstable, Bedfordshire, England, LU5 5RL. Tel. 0582 866124

LONDON ATARI CLUB: Requires genuine Atari users. We cater for a wide range of interests. The club is not limited to London. For a membership form, please send a s.a.e. to London Atari Club, P.O. Box 22, Ilford, Essex (Please note new address)



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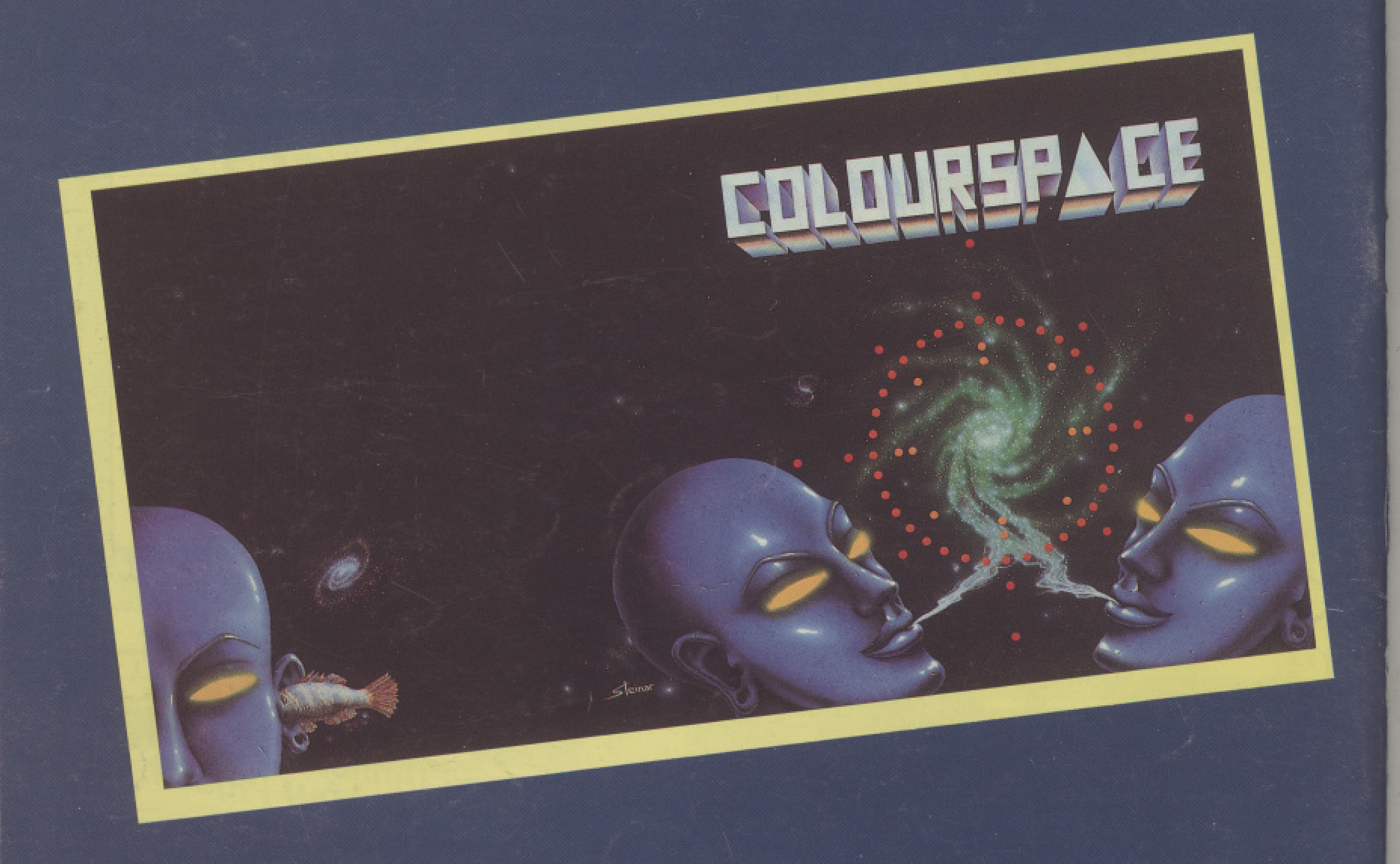
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